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## IMPROVING LONDON'S TRANSPORT

A publication of The Railway Gazette describing the new works schemes of the L.P.T.B., the L.N.E.R., and the G.W.R.

With a foreword by

The Rt. Hon. Lord Ashfield of Southwell

62 diagrams and maps, 97 photographs, and folding plate

## THE RAILWAY GAZETTE

33, TOTHILL STREET, WESTMINSTER, S.W.1.

## Railway Gross Revenue for 1946

THE traffic receipts of the four main-line railway companies and the London Passenger Transport Board for the four weeks ended December 29, 1946, showed a total decline of £775,000 or 2.9 per cent. at £24,879,000. Although coal and coke receipts improved by £299,000 to £3,627,000, there was a heavy fall in passenger receipts, which at £14,122,000 were lower by £820,000, and in merchandise receipts, which at £7,130,000 were down by £234,000. The figures in respect of the four weeks, and also for the 52 weeks of the year, compared with the similar periods of 1945, are summarised in the tables given below:—

## FOUR WEEKS ENDED DECEMBER 29, 1946

	1946 £000	1945 £000	+ or - £000	Per cent. + or -
Passengers ...	14,122	14,942	- 820	- 5.5
Merchandise ...	7,130	7,364	- 234	- 3.2
Coal and coke ...	3,627	3,328	+ 299	+ 9.0
Total ...	24,879	25,634	- 755	- 2.9

## AGGREGATE FOR THE FIFTY-TWO WEEKS OF THE YEAR

	1946 £000	1945 £000	+ or - £000	Per cent. + or -
Passengers ...	201,046	209,480	- 8,434	- 4.0
Merchandise ...	104,292	120,817	- 16,525	- 13.7
Coal and coke ...	50,159	48,113	+ 2,046	+ 4.3
Total ...	355,497	378,410	- 22,913	- 6.0

Of greater interest than the week's figures, however, is the total for the year 1946, for the recent return of traffic receipts covers all but two days of the year. Total traffic receipts, notwithstanding the increase in rates and charges from July 1 of last year, have declined by no less than 6 per cent. or approximately £23,000,000.

## Implications of the Fall in Revenue

In the absence of any figures relating to expenditure, it is impossible to evaluate the gross traffic receipts in terms of net revenue, but it seems clear that, as for 1945 the net pool revenue was £62,547,000, a fall in gross traffic receipts, even if there had been no advance in costs, would bring the net revenue some £4,000,000 below the guaranteed fixed annual sums, totalling £43,469,000, payable by the Government to the controlled undertakings. On the other hand, it is obvious that there has been a very substantial increase in costs during the past 12 months, and, therefore, there can be little doubt that the deficit which has to be met by the Government is considerably more than this amount. It is all the more strange, therefore, that, as was pointed out in our last week's issue, although the Minister of Transport accepted the majority of the recommendations of the Charges Consultative Committee relating to higher L.P.T.B. fares, no date for implementing that decision has yet been announced, and, so far as the main-line companies are concerned, the Committee's recommendations to the Minister, which were based on a public hearing lasting 25 days, have not yet been published, nor has any indication been given as to what the Minister's decision may be.

## Mr. A. L. Castleman

A family connection with transport extending over 100 years has been severed by the retirement of Mr. A. L. Castleman from the position of District Goods Manager (London), London Midland & Scottish Railway. Mr. Castleman entered the service of the old London & North Western Railway at Camden Goods Station in the first year of the present century, and his father was a former London District Goods Manager of that railway. His uncle, Mr. Charles Castleman, was Chairman of the London & South Western Railway from 1873 to 1874. The present Mr. Castleman's grandfather was associated with the transport industry in the old stage-coach days, when he entered the service of Chaplin & Horne. This family tradition of transport service, coupled with his own enthusiasm and enterprise, and, not least, his likeable personality, have done much to assure his success in the many facets of railway goods traffic with which he has been associated. Mr. J. F. E. Pye, Chairman of the Road Panel of the Metropolitan Regional Committee, in a letter published in our last week's issue, paid tribute to the good work which Mr. Castleman's patience, tact, and charm of manner have accomplished in matters related to the Metropolitan Road-Rail Conference.

### Overseas Railway Traffics

The week ended December 28, 1946, marked the half-year for the British-owned Argentine railways, and the aggregate increases in pesos shown by the Buenos Ayres & Pacific and Buenos Ayres Western were ahead of the corresponding figures a year ago. On the Buenos Ayres & Pacific the improvement of ps. 3,051,000 compares with ps. 2,806,000, while the Buenos Ayres Western increase of ps. 1,730,000 is ps. 148,000 above that recorded a year ago. The B.A.G.S. aggregate increase of ps. 3,617,000, on the other hand, compares with ps. 6,362,000 last year, and the improvement of ps. 2,709,447 in Central Argentine aggregate traffics compares with ps. 5,427,300 for the first 26 weeks of 1944-45. Argentina North-Eastern results for the 26 weeks showed an aggregate increase of ps. 367,500, as against ps. 132,900 last year, but the Entre Rios increase of ps. 170,000 compares with ps. 765,300 for the first half of 1944-45. Great Western of Brazil receipts for the 52 weeks to December 28 showed an increase of £220,900 on 1945, with aggregate traffics of £1,585,200. Some results for the 27th week of the current financial year are compared below:—

	No. of week	Weekly traffic	Inc. or dec.	Aggregate traffic	Inc. or dec.
Buenos Ayres & Pacific*	27	1,962	-610	60,156	+2,441
Buenos Ayres Great Southern*	27	3,536	-127	90,546	+3,744
Buenos Ayres Western*	27	1,250	-132	33,521	+1,598
Central Argentine*	27	3,311	-14	85,152	+2,723
Canadian Pacific ...	1	1,008,250	-109,000	1,008,250	-109,000

\* Traffic returns in thousands of pesos

For the first week of 1947, C.P.R. traffics showed a decrease of £109,000, comparing with a decline of £13,500 recorded in the first week of 1946.

### Transshipment of Goods Train Traffic

Of the problems associated with freight transport by rail, probably none has received more continuous thought than that of transshipment, and in his paper on this subject to the Institute of Transport on January 13, Mr. David Blee, Chief Goods Manager, G.W.R., touches on the salient points and develops in particular those features which appear to him the most likely to lead to progress in the future. The three broad criteria by which transshipment operations must be judged, are that the necessity for transshipment exists, that the methods employed shall contribute to a higher standard of efficiency of transport, and that the results are achieved with the utmost economy comparable with efficiency. This last factor alone must impel a fresh study of the problem with a view to elimination of transshipment to the greatest possible extent. In his paper, an abstract of which appears on another page, Mr. Blee develops at some length the problem of "smalls" traffic, based on G.W.R. experience, and shows how this problem forms an integral part of a general study of goods station working and design. He envisages a substantial development of container loadings in the future, and considers it not improbable that provision will have to be made for specially designed container yards.

### Railways in the Burma Campaign

The recently-published official report of South-East Asia Command\* forms an intensely interesting historical record of the Burma campaign. Various sections of the Burma Railways were vital lines of communication, both during the retreat from, and in the re-capture of, Burma. The critical Battle of Sittang, as a result of which we lost Rangoon and Lower Burma, hinged mainly on the great railway bridge over the river of that name. After it had been decked by the sappers to enable British and Indian forces and their transport to retreat across it, the bridge had to be blown with two-thirds of our forces still on the east or wrong side of the river. The principal objective of Wingate's Chindit operations was the demolition of the Mandalay-Myitkyina section, the lifeline of the Japanese in northern Burma and far in rear of their lines. During our advance back into Burma, locomotives, rolling stock, and over 2,500 tons of repair materials for operating the recaptured Burma Railways were either flown or carried 300 miles by mountain road from Dimapur, on the

\* "The Campaign in Burma: The Official Report of South-East Asia Command." Published by H.M. Stationery Office. Fully illustrated. Price 2s.

Bengal-Assam Railway. Three MacArthur locomotives, each weighing over 70 tons, were sent by road, loaded on heavy tractor-drawn trailers, accompanied by an 18-ton crane to lift their tails round the numerous hairpin bends.

### Electricity Nationalisation Proposals

The Government's plans for the nationalisation of the electricity industry adopts a basis of compensation to stockholders similar to that in the Transport Bill; Stock Exchange prices before and after the election of the present Government are to be the basis for an issue of British Electricity stock. Between £350,000,000 and £375,000,000 is estimated to be involved in compensation to companies and boards, including the Central Electricity Board, but exclusive of municipalities. It is proposed that the industry should be placed under a Central Authority, which, in turn, will control 14 Area Boards. The Central Authority would undertake generation and would be financially responsible for the whole of the industry; the Area Boards would control local distribution. Power to manufacture, sell, or hire electrical plant and fittings is given to the Central Authority under the Bill, which stipulates that electricity must be supplied by that Authority to any railway. The selection of Stock Exchange prices as the basis for compensation has aroused as much criticism as it did when it was applied to home railway stocks. The City Editor of *The Times* points out: "Though for many reasons less spectacular and involving less hardship, the real degree of injustice inflicted on the electricity stockholder is probably rather greater than that inflicted on the railway stockholder. Not that comparisons of degree are very relevant. It is the whole principle that is wrong."

### Steam and Electric Working in Switzerland

There has been a continuous increase in the locomotive-mileage run on the Swiss Federal Railways since 1945, and the total in the current year is expected to be 12.46 per cent. higher than two years ago. Only 4.2 per cent. of the total of 41,437,500 miles estimated for 1947 will be worked by steam locomotives, compared with 5.05 per cent. of the 1946 total and 7.19 per cent. of that attained in 1945. Over the three years 1945 to 1947 inclusive, the decrease in steam locomotive-mileage is expected to be something like 33 per cent. Electric locomotives in 1945 ran 32,897,669 miles. This figure rose to an estimated 35,000,000 miles in 1946, and is placed at 38,000,000 for the current year. On a percentage basis, the 1947 total for electric traction will represent an increase of 7.75 per cent. over 1946, and of nearly 16 per cent. over 1945. During 1946, the Swiss Federal Railways placed in service the first of a new series of lightweight electric locomotives for fast inter-city trains. These units were described in our issue of November 8, 1946. After an initial order for 26, a further 10 are now under construction.

### Railways and Full Employment

Throughout the varied network of industry, some change is always going on, and because of this, one person in every hundred is always temporarily out of work. Full employment, therefore, does not mean that everyone is in a job all the time, and if it did, then all industrial change would stop. Full employment means having rather more jobs than people to fill them. What are the consequences of full employment with special reference to the railways? This subject was dealt with by Mr. M. A. Cameron, Assistant Passenger Manager, Southern Area, L.N.E.R., at a meeting of the Railway Students' Association on January 14, and an abstract of his paper will be given in a later issue. For the railways, remarked Mr. Cameron, full employment means that traffic of all kinds will flow readily and in quantity. Traffic will only run freely, however, if charges are right, and charges are ultimately governed by costs, of which wages form a substantial proportion. Full employment also means that anyone who contrives to get higher wages without higher output, benefits only at the expense of others, and even then only so long as others do not get higher wages too. When people really understand what full employment means, they will not find it so hard to see that restrictive practices, though perhaps excusable when jobs were scarce, become in these days a public menace.

### The Derailment near Hatfield, L.N.E.R.

The report of Lt.-Colonel G. R. S. Wilson on the derailment near Hatfield, L.N.E.R., on July 15, 1946, which fortunately was attended with extraordinarily little harm to passengers, shows once again how a few factors can combine at a critical instant to cause a wheel to mount the rail, after which the extent of the mischief may vary considerably with the speed, composition of the train and type of couplings, curvature or straightness of alignment, presence of bridges or other obstacles, and many other circumstances. The principal details of the report, with diagram, appear at page 81. Colonel Wilson made a footplate trip on a "V2" class 2-6-2 locomotive to test the riding qualities, and concluded that this class—no longer being built—might be more than ordinarily sensitive to any weakness in lateral stability of the track or imperfections in cross-level; and that the accident arose from interaction between engine and track at comparatively high speed. There had been some diminution in cant under load on newly laid track, which on completion had appeared to be in perfectly good order, causing the engine to take a sudden, heavy, and, as the event proved, critical roll, which the fireman described as the worst he had experienced.

\* \* \*

### Running Shed Organisation on the L.M.S.R.

There is something inherently perilous in the position of a district locomotive superintendent, whose duty it is to see that as high a proportion as possible of the engines under his charge are engaged in revenue-earning traffic, whilst he is also at the mercies of the Stores Department for spare parts and of the Chief Mechanical Engineer's Department for any repairs which cannot be carried out at running sheds. Colonel Rudgard, who for many years has been in charge of motive power on the L.M.S.R., has shown, in his paper delivered to the Institution of Locomotive Engineers on Wednesday last, how these difficulties can be minimised by meticulous planning and careful organisation of the department. The paper, which we intend to publish in abstract in a forthcoming issue, covers the whole of the complicated departmental duties, as laid down by the L.M.S.R., and even includes details of the newly introduced "casualty league" system, designed to encourage personnel in the avoidance of engine failures by the award of "points" to the various districts (as in a football league) for four-weekly periods, and the award of challenge shields for exhibition at the end of each year. A further interesting section is devoted to the training and education of apprentices; and, finally, the complete schedule for the L.M.S.R. scheme of examination and repair in running sheds is given.

\* \* \*

### Transport Bill and Railway Hotels

A STUDY of the debate on the second reading of the Transport Bill shows clearly that the measure has been introduced solely for political reasons, as no attempt whatever was made to prove that a State-owned system would provide the public with a superior, or even equal service, at lower cost. So far as the railways are concerned, no system run on inefficient lines possibly could have stood up to the gigantic demands made on it during the war, and the compliment paid to the British railways by the Minister of Transport in his opening speech had been well and truly earned.

It is to be regretted, therefore, that the Minister subsequently should have thought fit to support his argument for the nationalisation of all inland transport by vilifying the railways. He claimed that the railways were now out of date and not in a position to give passengers the comfort of refreshment or travel which they ought to have. As an instance, he cited railway hotels, and said they are "first class for first class passengers, but there are no railway hotels to cater for the vast majority of persons using the railways."

The four main-line railways own and manage 53 hotels which provide accommodation for about 8,000 guests, and the Minister is surely aware that the class of ticket held by a passenger is never questioned by the managers of these hotels when they are dealing with applications for accommodation. Moreover, the prices charged at railway hotels compare very favourably indeed with those charged at non railway-owned

hotels, and this is well illustrated by the fact that one railway-owned hotel in London has had to decline between 400 and 500 bookings daily for the last two years.

The truth is that because of air-raid damage and Government requisitioning, there is an acute shortage of hotel accommodation throughout the country, but it certainly is not the business of the railway companies to undertake responsibility for endeavouring to meet this need. If the Minister wishes railway hotels provided "to cater for the vast majority of persons using the railways," as he puts it, he will present his proposed Hotel Executive with a very difficult task, both from the capital and revenue points of view, particularly if he wishes very much lower charges made for the accommodation. Even assuming this were done—and it could not be accomplished for several years at least—we suspect it would not be long before the old complaint of discrimination between first and third class passengers would be trotted out, as has been done so frequently and so unjustifiably in regard to meals served in restaurant cars.

We notice that the Minister made no reference to the very excellent facilities normally provided for passengers in the fleet of over 770 restaurant and buffet cars where in pre-war days many millions of meals were served annually at most reasonable prices. He complained, however, that "the refreshment rooms of railway hotels do not serve refreshment—meals and food." What he intended to imply is obscure, as all railway hotels provide meals for non-residents as well as for residents. If he meant refreshment rooms at railway stations, there were over 750 of these before the war. He may be interested to know that, at all the principal stations, refreshment, dining, and tea rooms have been provided for the service of meals and have been very well patronised by passengers and others.

At the smaller stations, considerations of space, demand, or staff have prevented meals being served at tables in the refreshment rooms, but light refreshments and drinks are supplied at all reasonable hours. At a number of the smaller stations the trade which might reasonably be expected is too small to justify the provision by the railway concerned of a refreshment room, and, in many cases, outside firms have declined to undertake the provision of a service. In the years immediately preceding the war, special steps were being taken to provide snack bars and other facilities for passengers who did not wish to use refreshment rooms, but the resumption of this work has been held up since the war by the general shortage of labour and materials.

It was admitted by Government speakers during the debate that they had not consulted the transport interests concerned before they prepared the Bill. Had they done so, they would surely have planned to create a Catering Services Executive and not merely a Hotels Executive, because the operation of refreshment facilities at stations and in restaurant and buffet cars are closely interwoven with the hotel services generally.

### Railways and the State

UNDER the title of "Railways and the State,"\* Mr. Ernest Short has written a thesis on nationalisation with the object of examining the problems involved and describing the experience of other countries in dealing with the question of transport control. Regarding the interests of the public as paramount, he suggests that nationalisation can be justified only if it yields advantages such as (1) increased efficiency, (2) lower charges for comparable services, (3) improved pay and better conditions for workers, and (4) provision for adequate expenditure on new developments.

Mr. Short stresses the importance of sound finance under state ownership, and urges that, in the event of nationalisation, there should be an annual "efficiency audit" of railway operations to ensure that the taxpayers are not called on to bear losses. He then proceeds to review recent railway history from the date of amalgamation to the time of the "square deal" campaign, and also discusses the road haulage industry. He concludes that "a system of agreed rates must be evolved that will cover cost, plus a reasonable profit, for all departments of national transport."

\* "Railways and the State: Facts and Factors of Nationalisation." By Ernest Short. London: Hollis & Carter. Price 2s. 6d.



Mr. Short's analysis for the most part covers well-trodden ground and does not bring to light any fresh point for consideration. Neither is he altogether successful in relating his historical and factual statements to the question of nationalisation. As an extreme instance of this weakness, one of the 84 pages of the book is occupied by a map picturing a different set-up for the four groups constituted in 1923. This scheme would have eliminated the Southern Railway by dividing its territory between the Great Western and the old Midland Railway. A proposal of that sort is open to many objections. We adhere firmly to the opinion that there would have been both operating and commercial advantages in having a separate group with the Midland as predominant partner, while leaving the railways south of the Thames to consolidate independently. The alternative scheme outlined by *The Railway Gazette* is explained on pages 270 and 271 of W. E. Simnett's book "Railway Amalgamation in Great Britain."\* It is doubtful, however, whether any different grouping would have staved off the present Government's plans for nationalising transport.

We are afraid that the introduction of the Transport Bill put Mr. Short's essay out of date before it was published. When the Bill passed its second reading in the House of Commons, decisions were taken on the main questions concerned, and probably Mr. Short's arguments will be treated as of purely academic interest.

### Railway Staff Training Colleges

ELSEWHERE in this issue we publish an account of the opening of the Southern Railway Staff Training College at Woking on January 10. That event is the latest development in the policy which the railway companies adopted many years ago of giving ambitious members of their staff opportunities for extending the knowledge acquired in the course of their day-to-day duties. The movement began long before the 1914-18 war with the establishment of classes in such subjects as "Regulations for Train Signalling by Block Telegraph" and "Passenger and Goods Station Accounts." These classes usually met after office hours, and were open, as a rule, to all members of the clerical staff who cared to attend. Certificates of proficiency were awarded to those who passed an examination, and were an asset to men who were seeking promotion to the grade of stationmaster, goods agent, or inspector, where an all-round knowledge of railway work was necessary.

The next stage in the progress of railway education was the starting of classes on advanced subjects, including railway operating, railway economics, railway law, and railway and commercial geography. These classes were arranged through the London School of Economics and the Universities or University Colleges at Manchester, Birmingham, Newcastle-on-Tyne, and other centres both in England and Scotland. Students attended in their spare time. Their success in passing examinations at the end of the courses was recorded in the staff records, and presumably was taken into account when they applied for promotion, in addition to their practical experience of railway work.

In 1937, the London Midland & Scottish Railway decided to go beyond the general procedure by establishing a residential school at Osmanton Park, Derby, for the training of selected students, which was opened on July 23, 1938. Colonel L. Manton was appointed Principal of the school, but the whole plan was interrupted by the outbreak of war in 1939, when the school was taken over by the Royal Engineers as a branch of Longmoor. A fresh beginning has now been made, and the progress of this pioneer scheme will be watched with great interest. In the meanwhile, the London & North Eastern Railway felt a pressing need during the war for an institution which could give an intensified course, extending over four weeks, in train-control arrangements and other aspects of operating. A residential school accordingly was opened at Grantby, Darlington, in January, 1944, under the charge of Mr. T. B. Hare, formerly a District Superintendent and a well-known writer on railway operating methods.

The operating school proved so successful that the L.N.E.R. was encouraged to open a commercial school on similar lines

at Faverdale Hall, Darlington. The aim of this school is to broaden the students' outlook and promote orderly thinking about railway commercial practice and relations with the public. The head of the commercial school is Mr. H. F. Sanderson, who had been District Goods Manager at Newcastle-on-Tyne, and who took charge at Faverdale in May, 1946. Both the Darlington schools accommodate 20 students in comfortable living quarters. We understand that the system of teaching calls for assiduous application on the part of the young men. Their work is watched carefully throughout the course, and at the close, a testing examination is set. A confidential report on each student's performance is submitted to the chief officer of his department.

We judge that the Southern Railway scheme is designed on somewhat similar lines to those of the two Northern companies, though the basis may be somewhat wider. In particular, instructors are being selected to deal with special subjects such as Continental traffic and labour relations. Obviously, it is desirable that each railway company should take its own line in handling subjects which are of peculiar concern to its own people. Like the L.N.E.R., the Southern Railway has chosen two of its own officers to run the training college—Mr. A. C. J. Payne as Principal and Mr. J. M. Leighton-Bailey as Bursar. Both are well known to the staff, and have had considerable experience as instructors in transport subjects. That is a good augury for the success of the new venture.

### G.W.R. Plant Demonstration Train

IN an era of limited resources in manpower such as the present, it is important for a particular industry that the employment it offers should be as attractive, and free from the more exacting manual tasks as possible, and equally important for the community in general that efficient use is made of the labour it has to offer. Far from being incompatible, the two ideals are complementary to each other, and the G.W.R. deserves the success its plant demonstration train has achieved by increasing the interest of its civil engineering staff in the use of plant and the manner in which their work can be rendered less arduous. The tour has been mentioned already in *The Railway Gazette*, and a fuller description is given in an article on page 73. Other considerations apart, such arrears of maintenance of the permanent way and structures as may exist, must be overtaken quickly if they are not to result in ultimate expenditure on a large scale, or in a serious loss of operating efficiency; and in this respect, also, the time is opportune for an examination by the railway civil engineer of such help as his colleagues in mechanical and electrical engineering may be able to place at his disposal.

The Great Western Railway began to build up its plant stock upwards of 20 years ago, with such items as tipping wagons, excavators, and concrete mixers. The stock now includes more than 30 different types of equipment. The usual procedure has been for new machines which appeared to offer possibilities to be hired and given a trial under normal conditions of railway work, in order that their scope and limitations might be fully appreciated before the purchase of one or more was considered. The experience gained both in this country and abroad in the use of mechanical equipment on railway work always has been watched closely to ensure that anything likely to prove efficient and useful was not overlooked. Earth-moving equipment for railway purposes is subject to restrictions as to size, particularly in this country, by the lack of lineside space and the desirability of easy transit between jobs without an undue amount of dismantling to come within the loading gauge; in addition, large earthworks usually are carried out by contract. Nevertheless, very effective use is made of truck dischargers, and the medium and smaller types of angle-dozers and excavators.

For the permanent way gang, the density of traffic also precludes much of the larger equipment which can be used in other countries, but there is definite scope for the provision of light equipment for boring and cutting both timber and rails, and nut running. The tools for such work must be strong, easy to handle, and reasonably light, qualities which are difficult to achieve in an entirely satisfactory manner where the power unit and the tool are combined. Pneumatic tools suffer from the disadvantage of requiring a bulky compressor, which, in turn, may require the service of a

\* "Railway Amalgamation in Great Britain." By W. E. Simnett. *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1. Price 15s.



crane for loading and unloading, and cannot easily be moved about the job. The present policy of the Great Western Railway is to use electric tools, for which the current is supplied by petrol-driven 3-kW. generators operating at 110 volts d.c., with a centre tapping to give a maximum of 55 volts to earth. The generator can be unloaded and carried about the site without difficulty by four men. Motor scythes are being used for grass cutting in ever-increasing numbers, and have enabled length gangs to devote more time to track maintenance.

For general work as carried out by bridgemen and shopmen, many different types of equipment are in use, and to mention only a few, light cranes, pumps, belt loaders, power rammers, cement guns, and compressors have done much valuable service, while additional tools, such as electric planers and hammers, are now being purchased. Smaller generators are also being bought, with floodlights for night and tunnel work; these machines also will be 110 volts with centre tapping. Only a few items of equipment have been mentioned, but these, with others, have contributed in a very large degree to increased output and the reduction of arduous and lengthy manual labour, and are playing a considerable part in the effort to overcome the arrears of maintenance due to the war years. It was with a view to increasing the knowledge of the Engineering Department men in the various types of equipment available by seeing machines actually at work, and handling the tools themselves, that the recent tour of the system by the plant demonstration train was arranged.

### Coal Firing for Gas Turbines

THE Locomotive Development Committee of the American Bituminous Coal Research Inc. has reported encouraging progress in the design and development of a fuel system for its experimental coal-burning gas turbine locomotives. The importance of this project can hardly be over-estimated. Unless we are to be subjected to a coal shortage lasting for an indefinite period in the future, the production of a gas turbine locomotive capable of burning coal, instead of imported fuel oil, would be of the greatest value in Great Britain. Even with a permanent coal shortage, the great saving in fuel, which would be possible with the use of coal-burning gas turbine locomotives in place of conventional steam engines, would justify the project.

At the present time, Great Britain is far ahead of any other country in the development of aircraft gas turbines. If the manufacturers of railway traction equipment take the initiative in drawing from the experience built up by the aircraft turbine engineers, in particular with reference to metallurgical developments and combustion research, there is no reason why this country should not be able to reach a similarly pre-eminent position in the field of gas turbine locomotives. On the other hand, unless intensive research and development in this direction are undertaken without delay, the opportunity will have been missed, and we shall be left behind by the Swiss and American engineers. The problem of applying coal firing to gas turbines is of such vital concern at the present time, that it should be receiving urgent attention both from the locomotive builders and from the National Coal Board.

### Kenya & Uganda Railways & Harbours

THE main line of the Kenya & Uganda Railways runs from Mombasa, in Kenya, to Kampala, in Uganda, a distance of 879 miles. There is a junction at Nakuru with a 134-mile branch at Kisumu, on Lake Victoria, where the main workshops of the Lake Marine Services are situated. A line runs from Voi into Tanganyika, connecting at Kahe Junction with the Tanganyika Railways. There are also eight minor and branch lines serving producing areas situated at a distance from the main line. All lines are of metre gauge, and the total route-mileage is 1,625. An account of the early development of the system was given in our January 18, 1946, issue, in connection with the jubilee of the arrival in Mombasa on December 11, 1895, of Mr. George Whitehouse and an advance construction party to begin work on the original Uganda Railway from Mombasa to Lake Victoria.

Regular cargo and passenger steamer services, covering 2,280 route-miles, are operated on Lake Victoria. Other marine services, on Lake Kioga, total 697 route-miles, and the administration operates also 627 route-miles on Lake Albert and the River Nile, extending into the Belgian Congo and the Sudan. A road transport system, 75 miles in length, provides connections for passengers and goods between Lakes Kioga and Albert, water transport between these lakes being impracticable on account of rapids. The Port Department operates Kilindini Harbour, Mombasa (Old Port) Harbour, and Port Reitz, all of which are on Mombasa Island and serve both Kenya and Uganda.

The report of the administration, which we have received from the General Manager, Sir Reginald E. Robins, shows that the combined earnings from all services for the year ended December 31, 1945, amounted to £4,802,354, an increase of £49,519 compared with 1944. Ordinary working expenditure increased by £287,640 to £3,127,643. The ratio to earnings of ordinary working expenditure on railways, lake steamers, and motor transport, excluding renewals, was 66.06 per cent., or 4.92 per cent. higher, and the operating ratio, including renewals, was 5.03 per cent. higher at 75.52 per cent. The balance of combined earnings over gross expenditure of £1,452,097 represented a return of 5.92 per cent. on the total capital expenditure of £24,536,133. After meeting loan charges, the available surplus was £582,510, compared with £821,027 in 1944. Comparative results of the railway, lake steamer, and motor road transport services are shown in the table below:—

	1944	1945
Passengers ... ..	2,768,767	2,848,378
Paying goods, tons ... ..	2,169,731	1,995,311
Revenue train-miles ... ..	3,887,668	3,938,256
Paying goods, ton-miles ... ..	569,091.208	596,317.414
Operating ratio, per cent. (excluding renewals) ... ..	61.14	66.06
Average haul, miles ... ..	271	308
Passenger receipts ... ..	£ 762,468	£ 735,469
Paying goods receipts ... ..	2,984,515	3,110,662
Gross earnings ... ..	4,004,772	4,116,381
Working expenditure ... ..	2,448,367	2,719,273
To renewal funds ... ..	374,526	389,288
Misc. transactions, net ... ..	Cr. 180,831	Cr. 201,274
Net revenue ... ..	1,362,710	1,209,094
Loan charges, etc. ... ..	643,928	651,543
Surplus ... ..	718,782	557,551

During 1945, the changing trends in the movement of goods traffic, which were observed in the preceding year, became more noticeable, the total tonnage handled falling by 3.7 per cent., largely as a result of a decline in relatively short-haul military traffic. The average haul consequently increased from 230 miles to 255 miles, and the total ton-mileage was higher by 2.9 per cent. Considerable success was achieved in the intensive use of wagons. A great economy was effected in terminal time, which was reduced by as much as 43 hours per wagon-journey as against an increase of only two hours in transit time.

Locomotive maintenance has been a serious problem, engine-miles run per failure showing an average of 20,816 as compared with 31,812 in 1944. A small addition to locomotive power was received during the year in the shape of two new 4-8-2 + 2-8-4 Beyer Garratts, of which the report states that "they appear to be excellent locomotives, no initial troubles having been experienced." The improvement in the motive power position was more than offset by the failure of the wheels of wagons obtained from the United States during the war, which resulted in 166 bogie wagons being out of service at the end of the year.

In a general review of the situation, Sir Reginald Robins says that the basic problem with which the administration is faced is still the labour situation in East Africa. Every committee which has been set up to inquire into the question of African wages has been confronted with the problem of complete urbanisation of the African detached from his native tribal area. It is argued that the African cannot be completely urbanised and live a normal family life in the towns on the present wage structure; at the same time, it is evident that, if existing rates and charges are to be maintained, no further and major increase in wages can be made unless accompanied by a considerable increase in the output of the workers. Every effort is being made to obtain such an increase, but in the present state of development of the African, and with the present shortage in consumer goods, it is difficult to devise an incentive to greater output.

## LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

### R.E. Transportation Units in Territorial Army

Transportation Directorate,  
War Office, January 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have received inquiries for some months past from a number of officers and other ranks who served in R.E. (Transportation) units in the pre-war Supplementary Reserve, or in other such units formed during the late war, as to what plans are under consideration for raising R.E. (Transportation) units again in the post-war Territorial Army. Recent announcements in the Press of the arrangements which have been formulated for the general re-constitution of the Territorial Army have stimulated interest in this subject.

I am directed to inform you that plans are under active consideration to form a number of R.E. (Transportation) units in the post-war Army, and particulars will be published as early as possible. It is hoped that the recruitment of volunteers for service in these units will begin within the next few months.

Yours faithfully,

R. F. O'D. GAGE,  
Brigadier, C.B.E., M.C.,  
Director of Transportation

### New Southern Railway Main-Line Coaches

60, Rafford Way,  
Bromley, Kent, January 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Although the Southern Railway has in each of its new coach sets, described in your January 3 issue, provided 80 seats in compartments as against 64 in saloon sections, any claim that by so doing it has met the desires of the public—as expressed in the results of the questionnaire—completely loses its justification when one considers each class separately.

The 24 first class seats are all in compartments, while the third class seats are divided in the proportion of 56 in compartments to 64 in saloons, so the preference of the third class traveller for compartments is seemingly ignored, though it is the third class passengers who far outnumber the first.

The logical arrangement would have been for each of the third brakes to have contained three compartments instead of two, and for the saloon sections to have contained 24 seats in place of 32; this would have given the third class passengers a total of 62 seats in compartments and 48 in saloons, which would have been more in keeping with the alleged desire to meet the wishes of the public.

Yours faithfully,

ARTHUR M. S. RUSSELL

### Fifty Years of Rail Transport

London, N.13, January 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is with great pleasure and interest I read the article of Mr. H. J. Peacock on "Fifty Years of Rail Transport" in your issue of December 20. There have been many "rankers" like myself who have been fortunate in promotion, but so far and no farther; our next step is for positions reserved for traffic apprentices or university graduates.

On the London & North Eastern Railway, positions of Assistant District Superintendent and upwards are given to apprentices, and the man who has learnt his railways the hard way is not considered for these positions, but his experience is relied upon and it proves valuable to the apprentice. What of the future? One can see the railways being "top heavy" with inexperience; lads today are not accepting the railways as a career as in days gone by, and as the experienced men become fewer by retirement, dissolution, and other factors, there will be a big gap impairing efficiency.

Railway operative working always has been considered a semi-skilled job, the rule book will prove this—and men can still learn new ways of doing their job no matter how long they have been employed. One does not see apprentices in charge of signal boxes or driving an engine or held responsible for permanent way repairs. Apprentices do not have the advantage of long practical training; they see it during their tuition, together with other phases of railway operation, and one would imagine that, having learnt a little of each, the whole business becomes a maze in the end, and they are then back where they started.

Again, when a practical man applies for promotion he is interviewed by the district officer, who, in most cases, was an

apprentice; how can such an interview be without prejudice when the applicant is the more practical of the two? It is like a pupil considering the suitability of a prospective school-master.

I think the management should give serious thought to the question of promotion; and let us get back to the days of discipline, experienced, contented, and ambitious staff, and recruit suitable men from the ranks for such positions as district officers, thus providing an efficient service to the public and trader.

Yours faithfully,

H. HILL

### Nationalisation

Glasgow, January 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—

Now or Never is the time  
Action is the word sublime;  
Take all Transport as it is  
Independence is its bliss.  
Ownership must therefore be  
Not the State's monopoly.  
And, if one may be concise,  
Legislation, otherwise,  
Is, in this event alone,  
Socialism overgrown.  
All that matters is that we  
Transport's own Authority,  
Indicate that one and all  
On our merits do so call  
Nought shall harm, what e'er befall!

Yours faithfully,

N. B.

### Concrete for Railway Construction

Huntington Hall, York, January 3

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I regret that Mr. Pearson has failed to understand my comments on monolithic concrete structures—I can assure him that they are quite orthodox, and, furthermore, in accord with the basic hypotheses of modern elastic and plastic concrete theories. Except in certain elementary cases, concrete is not made up of separate parts under stress, but is a monolithic whole ensuring continuity between the component parts of the structure. The flow of stresses is rarely brought to a single point, and consequently the problem is not a static one, but essentially a statically indeterminate one, to be solved by elasticity.

I would point out that a simple floor system, to which Mr. Pearson refers in your December 27 issue, may be far less simple than he assumes. This is particularly the case in warehouses, which, if economically calculated, allowing for elasticity in the supports and the influences of adjoining panels, must be considered as forming part of a three-dimensional elastic multiple frame.

Although limited construction depth and the difficulty of obtaining track possession restrict the uses of concrete in many instances, this is not of the first importance when dealing with large bridges and important renewals. The weight and nature of concrete, which Mr. Pearson condemns, may often be beneficial in resisting braking efforts, by standing up well to vibrations, and very considerably reducing maintenance expenses.

May I add that I have had the pleasure of being a railway engineer both abroad and in this country, and I can assure Mr. Pearson that, although much is being done to increase the popularity of concrete in Britain, this material could be used on a still larger scale.

Yours faithfully,

M. D. BRISBY

SWISS RAILWAYS INSTRUCTIONAL FILMS.—The Press Office at Berne, of the Swiss Federal Railways, has issued a list of films dealing with railway subjects which are available on loan to clubs, schools, and similar bodies. Most of these are produced both in the 35-mm. and 16-mm. sizes, and may be had with the commentary either in French or German. Some of the films present interesting information on Swiss railway operating methods in the form of short stories, and one film reconstructs travel conditions in the early days of Swiss railways. This historical film is the first instalment of a special three-part picture, the concluding reel of which was made in 1946, and which shows the latest developments in railway services.

## The Scrap Heap

RAILWAY POST V. POST OFFICE

Of the last 52 parcels sent by post, 22 arrived damaged, while of the last 2,000 parcels sent by rail, three only arrived damaged. From the Post Office, I have never been able to get satisfaction, while the railway company in every case has paid me in full for damage done. One is a Government enterprise, while the other is a private one.—From a letter to the "Yorkshire Post."

### 100 YEARS AGO

From THE RAILWAY TIMES, January 16, 1847

#### PRICE THREEPENCE.

**THE DAILY NEWS,**  
London Morning Newspaper, in Time for the Morning Mail.

It is remarkable, that more than a century since there were Eighteen papers published in London, daily or three times a week—while now there are only Fifteen! In the City of New York, more daily papers are published than in all England, Scotland, and Ireland, put together. What is the cause?—Price!

That the public know the advantage of having a Daily Paper is manifest, from the thousands who pay threepence for a paper the day after publication. What, then, are the causes which maintain the high price? First, the capital required to be invested. Next, the various talent, knowledge, and experience which must combine to produce the result. The number of the requirements have, in truth, occasioned something very like a monopoly—and monopoly always commands its own price. Thus, whilst capital and competition had been doing good service in all other things, nothing had been attempted for the political and social wants of three great nations; and a Daily London Newspaper remained, until the establishment of the *Daily News*, a costly luxury, in which only the wealthy could indulge.

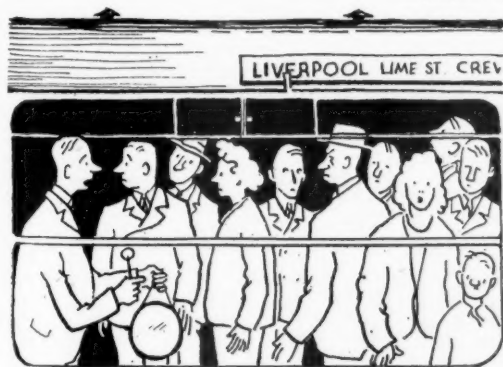
The *Daily News* looks for support, not to a comparatively few readers at a high price, but to many at a low price.

The *Daily News* is the same size as all other journals were within seven years; it is larger than many of the high-priced daily journals are now; and, in every particular of interest, it contains as much information as the most successful amongst its contemporaries. The *Daily News* is expansive; and double sheets are given whenever News, important Debates, or Advertisements require it.

Every News Agent will, we hope, supply the Paper, by post, at Threepence, where payment is made in advance; when credit is given, it is a matter of private arrangement, with which the Proprietors have nothing to do. As, however, in an undertaking so bold it is advisable to guard against possible inconvenience, the Proprietors will undertake to get all persons supplied who shall forward a Post-office order, made payable to JOSEPH SMITH, *Daily News* Office, Whitefriars, London, at the rate of 19s. 6d. for every three months.

An Evening Edition, under the Title of THE EXPRESS, is published every day at Four o'clock, containing full reports of the Markets of the day.

*Daily News* Office, Whitefriars, Fleet-street, London.



"Take your seats for the first lunch. Pass it on and give the gong a bang"

[Reproduced by permission of the proprietors of "Punch"]

**CIVIL SERVICE STAFFS**  
Mr. Dalton, in the House of Commons recently, circulated the following details of whole-time non-industrial Civil Servants, analysed by staff groups:—

Staff group	April, 1939		July, 1945		October, 1946	
	Men	Women	Men	Women	Men	Women
Administrative ... ..	2,068	52	3,860	928	3,442	556
Executive ... ..	18,276	1,031	38,844	12,224	34,324	9,550
Clerical and sub-clerical ... ..	77,540	35,313	90,553	161,772	127,921	137,073
Typing ... ..	64	15,273	33	37,415	70	30,259
Professional, technical, and scientific ... ..	10,906	135	29,496	2,409	38,253	2,819
Minor and manipulative ... ..	127,420	35,192	92,215	77,439	124,998	65,886
Technical ancillary staff ... ..	24,151	1,717	53,881	12,883	45,035	7,285
Inspectorate ... ..	5,259	528	4,359	744	5,155	731
Messengers, porters, etc. ... ..	13,669	5,707	33,851	14,075	30,850	13,021
Total ... ..	279,353	94,948	347,092	319,889	410,048	267,180

Part-time staff cannot be analysed in this way, as similarly detailed figures for part-time staff are not held centrally. The numbers of part-time staff were: April, 1939, 50,595; July, 1945, 96,729; October, 1946, 72,722.

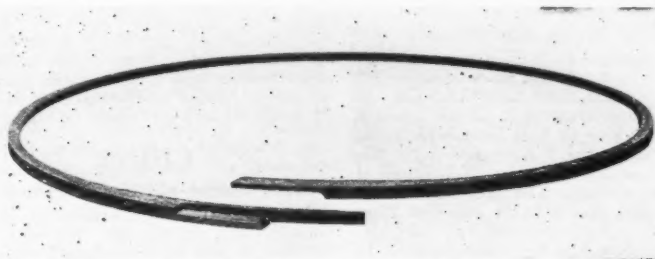
#### A NINETEENTH CENTURY PISTON RING

A wrought-iron locomotive piston ring has come to light. It belonged originally to a locomotive that worked on the Bodmin & Wadebridge Railway—a line opened

present condition, after all these years, shows the very fine craftsmanship of the early nineteenth century. Mr. Barton has presented the ring to Mr. O. V. Bulleid, Chief Mechanical Engineer of the Southern Railway.

#### GOVERNMENT AND THE PRESS

The office of the small provincial newspaper at which I work received an average post on Tuesday morning, January 7. It included 15½ typewritten 8vo sheets from various Government Departments made up



Wrought-iron piston ring from an early Bodmin & Wadebridge Railway locomotive

for public traffic on September 30, 1834, and now part of the Southern Railway. The ring was forged and fitted by a driver the Bodmin & Wadebridge company in the days when the driver did all his own repairs, being in turn blacksmith, fitter, painter and driver. The engine to which it was fitted was a 0-4-0 with outside cylinders, steeply inclined, 12 in. bore and 24 in. stroke, with 4-ft. 6-in. dia. wheels, and a boiler pressure of 80 lb. per sq. in.

The piston head was made up of five wrought-iron plates, three of them cylinder size, and the other two small enough to allow the enlarged part of the ring to revolve all round the head, and thin enough to form the bottom of the ring groove. The head was fitted with four bolts to secure these plates together, and was fastened to the rod by a nut.

The driver who forged the ring was named Bonney, and he gave it to the late William Drew, who was employed at Exmouth Junction

as follows: Air Ministry, 5½; Central Office of Information, 2½; Ministry of Agriculture, 4; Ministry of National Insurance, 1½; War Office (in two separate envelopes), 2. None of the material was suitable for any purpose but salvage.—Mr. Anthony Brode in a letter to "The Times."

#### ENDING PRIVATE ACCUMULATION

On the general problem one may ask what is to be the outcome of this increasing pressure upon people to live on their capital. Have we come to the end of the epoch of the private saver who hands on a legacy to posterity? What gratitude is now displayed to the past generations whose private savings furnished the enormous capital inheritance which has come down to us? The class that furnished the housing for a population swelling from ten to over forty million is an object of contempt and is savagely mulcted by rent restriction. The return for the enterprise and thrift that covered this and other lands with a network of railways is a jibe at the outworn state of its handiwork after six years of war. The State takes over with a "Think yourself lucky you get any compensation." Give your children a good education and the best start in life and then dissipate your capital wealth over your lifetime. Is this the required order of life in the future?—G. L. Schwartz in "The Sunday Times."



## OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

### SOUTH AFRICA

#### Operating Improvements

Improved operating conditions on the Cape Northern system main line will result from the installation of new telegraph and telephone systems between De Aar, Kimberley, and Klerksdorp, to cost £150,000. The somewhat arid country traversed by the main line to the North entails considerable difficulty in supplying water, and for this reason some £70,000 has been allocated in the present programme for the improvement of pumping and clarification plant, and the provision of additional storage tanks.

#### Road Motor Services

West of the main line, between Kimberley and Vryburg, lies a vast stretch of pastoral country, which is one of the largest milk- and cream-producing areas in South Africa. This area is fed by a system of road motor services with a route-mileage of nearly 3,000. To provide for the increasing volume of traffic, new motor transport repair workshops are to be erected at Beaconsfield, and further garage accommodation is to be provided at Taungs, Postmasburg, Mafeking, and Kirstonia.

#### Natal System Improvements

The passenger lines from Durban as far as Booth Junction are to be quadrupled, to allow for additional suburban trains and a general improvement in service. A new double line is to be built from Berea Road to Greyville, and a new station on this line will save unnecessary congestion at the main station. The doubling of the South Coast line is to be extended from Merebank to Umbogintwini, and a double-track avoiding line has been planned to give direct access from Jacobs to Clairwood South.

The old main line to Hillcrest is to be strengthened and electrified, and a number of level crossings will be eliminated. Straightening of the Umlaas Road-Pentridge section of the old main line, which already is under way, is part of the track improvement scheme. This section also is to be electrified. Finally, the main line from Pietermaritzburg to Ladysmith is to be strengthened, and all single-line sections, totalling 90 miles in length, are to be doubled.

### RHODESIA

#### New Goods Rolling Stock

The rolling stock shortage in Rhodesia, to which reference was made in *The Railway Gazette* of November 1, 1946, has been alleviated in some measure by the arrival of 50 30-ton covered wagons purchased from the Sudan Railways. These wagons form part of the American lease-lend supplies to the Sudan, and were bought in May, 1946. They have a capacity of 30 tons, but on account of the small axlebox journals with which they are fitted, the loads will be limited to 25 tons. It is proposed to use these wagons mainly on branch lines in order to release other types of covered vehicles for main-line use. The wagons arrived at Beira, whence they were despatched to Umtali for erection of the bodies.

Delivery is beginning of 300 high-sided steel bogie wagons of 42½ tons capacity ordered from Great Britain, and these are

expected to be received at the rate of 25 a week; in addition, the railway is awaiting supply of 100 covered goods wagons of 30 tons capacity. An order has been placed, also, for 20 4-6-4 + 4-6-4 Beyer-Garratt locomotives.

### INDIA

#### Floods in Southern India

Heavy rains in South India in December resulted in serious dislocation of railway traffic between Bombay and Madras. Breaches were reported at several places on the North-West line of the M. & S.M.R. The North-East route of the same railway was declared unsafe. Booking of parcels from Madras to places south of Trichinopoly was stopped. The Madras-Bombay line was breached in sixteen places, many of the breaches being serious. In places, lengths of as much as three-quarters of a mile were thus affected.

#### Electrification Proposals Studied

The Government of India is studying a scheme for the electrification of about 1,500 miles of railway. This is part of the long-term post-war development scheme. It covers the Bombay-Ahmedabad section, the Howrah-Moghal Sarai section via the Grand Chord, and suburban services of the E.I., B.A., and B.N. Railways round Calcutta. The proposed electrification will, it is estimated, result in an annual saving of 600,000 tons of coal, of which 40 per cent. would be high grade.

### CHINA

#### Modernisation and New Construction

The first stage in a new national railway construction programme provides for building 34 new lines, totalling 7,392 miles in length. Existing railways in China cover only one-eighth of the country, and it is the aim of the programme now being undertaken to provide every inland centre of any consequence with direct or indirect rail communication to a seaport. Another important object is the development of international trade across the south-western frontier, so the plan calls for the completion of the Yunnan-Burma Railway within five years. This railway was projected during the war as an alternative to the Burma Road. Its approxi-

mate course from Kunming to Lashio was shown in *The Railway Gazette* of February 9, 1945, at page 136. Negotiations have begun, also, between the Chinese and French Governments regarding the future of the railway from the Yunnan frontier at Hkoku to the coast of French Indo-China at Haiphong, and a free zone for Chinese imports and exports at that port.

#### Priority for War Damage Repairs

Before new construction begins, priority must be given to repairs of damaged lines. Some 4,200 miles of railway have been damaged in recent months during fighting between Government and Communist forces. The two North-South trunk lines—the Tientsin-Pukow Railway and the Peiping-Hankow Railway—have suffered particularly heavily. Meanwhile, the overhaul of lines which sustained damage or fell into disrepair under Japanese occupation has been pursued with vigour. Apart from the Shanghai-Nanking and Shanghai-Hangchow Railways in the metropolitan area, which have resumed operations, reconditioning work is still proceeding on the Chekiang-Kiangsi line, which serves two South-Eastern provinces. Part of this line is expected to be functioning again by March this year. As lines are restored to traffic, a re-grouping of administrations is taking place. A map of the new groups was reproduced in *The Railway Gazette* of September 13, 1946.

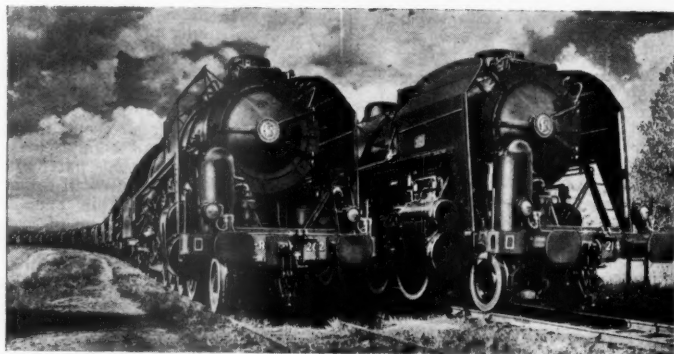
According to an unconfirmed report, the authorities in Canton have been negotiating with an American organisation for a big loan for the rebuilding and modernisation of the Canton-Hankow Railway. The programme, which will make the line comparable with any in Europe or the United States, is estimated to take about three years at a cost of 60 million American dollars. An American railway engineer is also reported to have been invited by the authorities to submit plans for carrying out this programme.

### CANADA

#### Main-Line Locomotives for France

One hundred locomotives are being constructed at the Montreal Locomotive Works, Montreal, for main-line passenger and freight service in France. These are the first ever to be built in Canada for the French National Railways. Work was begun on the order in September, 1946, and by the end of November, 35 locomotives had been completed. The balance of the order will be completed by May this year. The Montreal Locomotive

#### First Canadian-Built Locomotives for France



The first batch of 100 2-8-2 locomotives under construction by the Montreal Locomotive Works for the French National Railways

Works is a subsidiary of the American Locomotive Company.

Originally, all the engines were to be shipped direct from Montreal. This plan had to be changed on account of the seamen's strike making shipping unavailable. Instead, the first 35 were fitted with Canadian type couplings and hauled by regular freight trains to New York. Twenty of the locomotives are coal burning, and will be fired by mechanical stokers. The balance will burn oil, but any of the engines can be converted easily for either fuel according to current requirements.

## UNITED STATES

### Rates Increase Authorised

Increases in freight rates averaging 17·6 per cent. have been authorised by the Interstate Commerce Commission, and came into effect on January 1. The order supersedes a temporary increase granted in an emergency action in June last year. The commission has continued the wartime increase of 10 per cent. on passenger fares. Results compiled by the Bureau of Railway Economics of the Association of American Railroads show that gross revenue of the Class 1 railways for the first ten months of 1946 was 16·9 per cent. below the 1945 figures. Operating expenses in the same period fell by 4·8 per cent. Forty-nine Class 1 railways failed to earn interest and rentals in the first ten months of the year.

### New Chicago-Indiana Streamline Trains

A new diesel-hauled streamline service, called the "Whippoorwill," was introduced by the Chicago & Eastern Illinois between Chicago and Evansville, Indiana, on November 10. This seven-car train was the second set of streamline equipment to be delivered to the C. & E.I. by the Pullman Standard Car Manufacturing Company during October, 1946, a four-coach train, the "Meadowlark," having been placed in service on October 6 (see *The Railway Gazette* of January 10). The new train consists of a combined luggage and

passenger car, a dining car, four coaches fitted with Sleepy Hollow reclining-type chairs, and an observation car. A description of the Sleepy Hollow seating supplied recently to the Canadian Pacific Railway was given in *The Railway Gazette* of September 13, 1946.

## ARGENTINA

### Negotiations in Buenos Aires

The main point on which the local negotiations with the British-owned railways are hinging, relates to the valuation that is to be placed on the assets which the companies will contribute to the consortium, in which they are to be joint partners with the Government. No definite figure was fixed in the agreement of September 17, 1946, but the existence of a minimum valuation may be deduced from the fact that it was agreed that the Argentine Government would guarantee a minimum return of 4 per cent. and of ps. 80,000,000 per annum. Reports indicate that Sr. Miguel Miranda refuses to go beyond that minimum, whereas Sir Montague Eddy is stated to be pressing for ps. 3,000,000,000, which is deemed to be nearer the actual value of the physical assets, and would render it possible to pay some sort of dividend on the ordinary shares. Both parties at present appear to be resorting to the "hard bargaining" methods that were employed in the earlier negotiations.

### Future of Argentine Railways

A recent statement by Sr. Miguel Miranda, Chairman of the Central Bank of Argentina, is of interest in view of the negotiations proceeding between representatives of the British-owned railways and the Argentine Government. Sr. Miranda said that Argentina had exhausted her transport resources in order to serve the United Nations, "without getting anything in exchange." The problem of rehabilitation had to be solved, and the resources of the Trade Promotion Institute would be used to that end. If agreement was reached, they would provide

ps. 500,000,000 for the modernisation of the British-owned railways. As these railways stood now, they could not serve the requirements of the country, and Argentina required quick and economic transport. The Trade Promotion Institute had just purchased the three French-owned railways, and as soon as the constitution of a mixed consortium with the British-owned companies was arranged, the time would have come to co-ordinate transport of all kinds all over Argentina. He believed that with the savings thus effected, Argentina would be able to face the new expenditure due to higher salaries, social improvements, and so on. When co-ordination had been effected, the time would have come to form a company, with the help of private Argentine capital, for the operation of transport services; the institute would then be repaid the capital advanced, and it would not be necessary to resort to loans of any kind.

## EGYPT

### Relief Lines for Cairo—Alexandria Route

A project has long been proposed for the construction of a relief line from Tewfikieh, situated on the Cairo—Alexandria main line between Tanta and Itiy-el-Baroud, to El-Mahalla Junction, where the main line for Alexandria branches off from the goods line to Gabbary and the quays. This project, the object of which is to relieve the congested section of the main line between Teh-el-Baroud and Alexandria of goods traffic, is likely to be executed in the near future, in view of the intensified train service envisaged between Cairo and Alexandria when the new diesel-electric trains now on order in England arrive in this country. The line would serve two rich agricultural centres.

In connection with the increased Cairo—Alexandria train service, referred to above, plans are being prepared for the provision of through running lines for non-stopping trains at Benha and Damanhour.

## Publications Received

**Industrial Injuries.** ("This Is The Law" Series). By H. Samuels and Robt. S. W. Pollard. London: Stevens & Sons Ltd., 119/120, Chancery Lane, W.C.2. 74 in. x 4½ in. 87 pp. Paper covers. Price 3s. net.—The object of this popular series of little books is to interpret various aspects and branches of the law for the layman, and the present work is intended to acquaint trade union officials with the rights of injured workmen under the National Insurance (Industrial Injuries) Act, 1946, which is expected to become effective early this year. There are two useful appendices, the first comparing the benefits under the new Act and the old Workmen's Compensation Act, and the other listing matters of detail to be prescribed by regulations.

**British Standards for Workshop Practice.** General Editor: Mr. J. E. Baty, M.I.Mech.E., A.M.I.E.E., M.I.P.E. Introduction by Sir William Stanier, F.R.S. London: British Standards Institution, 28, Victoria Street, S.W.1. B.S. Handbook No. 2. 483 pp. Price 12s. 6d. net.—B.S. Handbook No. 2 was first issued in 1943, when the quantity of non-standard tools and gauges being ordered was causing concern to the Government supply depart-

ments. It was suggested that the essential data from the various British Standards applicable to engineering workshop practice should be gathered together and published in one convenient volume. Three impressions of the first edition have been published. Modifications which have been made since 1943 to certain of the British Standards reproduced in the handbook have now made necessary the issue of a completely revised edition.

**Gas Turbines.**—The Bristol Aeroplane Co. Ltd., Filton House, Bristol, has published an illustrated folder describing the part played by the organisation in the development of gas turbines for aircraft propulsion, with special reference to the company's Theseus power unit. The Theseus gas turbine incorporates an axial and a centrifugal compressor. On the way from the compressors to the combustion chambers, the air passes through a heat exchanger, where its temperature is raised by means of the exhaust gases, and by this means a high thermal efficiency is obtained. The hot gases from the combustion chambers actuate two turbines, one driving the compressor and the other coupled through reduction gearing to the propeller shaft. The residual energy in the gases is used to provide a jet, the power output of the unit at 300 m.p.h. being divided between the propeller shaft

(80 per cent.) and jet (20 per cent.). The folder includes a sectional drawing of the Theseus gas turbine, which clearly shows the internal arrangements of this type of power plant.

**High-Speed Machining Copper.**—A high-speed machining copper with the registered trade name of Kutern has been produced in the research laboratories of the Metals Division of Imperial Chemical Industries Limited, and the characteristics of this material are described in a new booklet published by the company. Kutern is an alloy of pure copper, having greatly improved machinability, which has been assessed at 90 per cent. of that of free-turning brass, and it may be machined with tools, tool speeds, and tool settings similar to those used for brass. The material, also, is much easier to drill than pure copper, comparative penetration tests having shown that it has a rating of 92 per cent. of that of free-turning brass, compared with only 32 per cent. for copper. Kutern can be supplied in rod, tube, or sections, and is very suitable for large or small repetition parts which have to be made by machining, or have to be machined during fabrication. It is being used increasingly for items of electrical switchboard apparatus that demand a certain amount of machining, such as connectors, bolts, studs, and contactor parts.

## The Transshipment of Goods Traffic\*

*Possible lines of development outlined by Mr. David Blee, Chief Goods Manager, G.W.R.*

THE factor of economy alone must impel a fresh study of the transshipment problem, because not only have wages costs risen by some 75 per cent, since 1939, but also at practically every recorded station the speed of working has generally deteriorated, in some cases by as much as 33½ per cent. Moreover, if these statistics were subjected to further analysis, it would be found that speed of movement on goods sheds, as distinct from that in yards, has deteriorated even more markedly.

Among the series of studies given in the past to the problem of transshipment of "smalls" traffic, was one conducted by the G.W.R. under the aegis of a former Chief Goods Manager, the late Mr. E. Ford, in the reorganisation of G.W.R. tranship working concluded in 1932.

Analytical traffic studies conducted throughout the G.W.R. system served to demonstrate the extent to which "smalls" traffic was moving to its ultimate destination via a series of two or more of these several tranship points. That investigation, impelled by a broad knowledge of what was occurring, and with a realisation that 24 hours' delay occurred with each transshipment, was undertaken to obtain greater efficiency of service for "smalls."

Nine residual tranship stations—Paddington, Bristol, Plymouth, Newport, Cardiff, Llanelly, Hockley, Wolverhampton, and Chester—were ultimately selected as being strategically so placed as to form natural focal points for wide ranges of stations. The selection was partly geographical, partly an outcome of the survey of traffic flows, partly determined by the volume of originating traffic available to form a foundation for regular direct wagon loadings, and, partly, by the availability of goods shed accommodation to provide adequate regular standage of wagons. The subsequent programme was designed to give a next-morning delivery between these centres and even beyond.

In the detailed traffic analyses on which these conclusions were based, it became clear that, while a general improvement in transits must result from the projected reorganisation, the transit time for certain fringes of traffic would be worsened unless special provision were made. Accordingly, a series of road motor services was instituted, to operate from such centres as Reading, Oxford, Newton Abbot, Wolverhampton, Chester, Shrewsbury, Ruabon, and Wrexham.

These were essentially road tranship services, in substitution for the itinerant station truck, working between their bases and the distant stations on their respective routes, dropping off traffic at intermediate stations the same morning as received at the base station.

### Goods Station Working

Those familiar with the working of a large goods shed also will be familiar with the considerable cross-movement that must occur in the discharge of inwards wagons variously containing goods for delivery and goods for transshipment respectively.

In the paper given before this Institute by Mr. T. W. Royle, Vice-President, L.M.S.R., last session, we were made aware of the notable contributions which the L.M.S.R. research organisation has

already made towards the resolution of this problem. Studies have concurrently been conducted independently by the G.W.R., and, while these do not lead to the same conclusions as to method, there is a unity on basic principles.

Notably, there is agreement as to the desirability of dealing with outwards "smalls" by what is becoming known as the method of perambulation, i.e., by the cartage vehicle proceeding from truck to truck in covered yard, in place of transshipment of the load over shed platforms and trolleying to truck.

There is thus projected a complete segregation of inwards and outwards goods shed traffic, with considerable advantages both in speed of terminal operations, and in handling costs. The natural corollary to this is to remove the "transfer" traffic from inwards sheds and to perambulate it for outwards wagon loading by internal or domestic cartage organisation.

### Design and Layout

There remains the question of the design and layout of goods terminal stations, and here, again, it is impractical to generalise, the solution of these problems depending on a series of particular studies. For example, from 1923 onwards, the G.W.R. entirely rebuilt its more important goods terminals, and improvements were also effected at many other depots.

With such large capital expenditures in relatively recent years, any abandonment and further rebuilding of these projects could not be justified unless, and until, the greatest possible improvement of methods of working, including mechanisation, within the layout of the existing structures has been effected, and that it is then demonstrable that such further improvements in service, with economy in the terminal and transshipment operations, could be effected as, capitalised, would justify a complete rebuilding to provide for fundamentally changed operating methods.

Thus, a two-fold approach is opened up, first the extent to which mechanised handling can be introduced at existing and relatively modern sheds, and, second, the design and layout of future sheds, embodying the product of the latest thought on mechanisation and worked on the basis of the principles already outlined.

The trend of other developments will tend largely to eliminate the multiplicity of small goods sheds, but, in so far as necessity exists in the future, the size of the small goods sheds will be confined to the minimum length of cart-front necessary for standage of the road transport equipment required, with provision for redressing of the shed.

The principle of confining the shed to the smallest practicable dimensions, with mechanical provision for redressing, is designed to reduce to the minimum the length of trolley runs, and, with this in mind, any further advantages to be attained by mechanisation of handling from truck to cartage vehicle may prove negligible.

So far as the medium-sized shed is concerned, which receives daily up to 150 shed wagons, inwards and outwards traffic should be separated, provision being made for outwards traffic in covered yard, with direct loading to truck from cartage vehicle. The inwards shed accommodation might consist of two short roads of a

maximum each of ten wagon-lengths, from which wagons can be unloaded on to a centrally-placed conveyor belt serving both roads, which will be redressed with wagons alternately so that no standing time occurs.

The relatively modern physical assets in the large G.W.R. stations present initially a problem of mechanisation which will probably develop along the lines of a combination of electric platform trucks and stillages and conveyor belts.

An analysis of the "smalls" traffic handled during a selected four-weekly period at the three largest goods stations on the G.W.R. system revealed that at Paddington 51 per cent. of the total tonnage handled over the shed was transfer traffic; at Bristol, 47 per cent.; and at Birmingham, 61 per cent. When it is realised that the cost of handling at the larger goods stations is about 6s. 6d. to 7s. per ton, and that the total tonnage of intermediate transshipment traffic handled at G.W.R. stations alone, is approximately a million tons a year, it will be realised how important it is to bring transshipment traffic to the irreducible minimum.

In the final development, the whole countryside served by the G.W.R. has been divided into a series of zones. The area embraced by each zone varies according to traffic density. For example, the Birmingham zone has an area of influence of 160 sq. miles, whereas the Swindon zone serves an area of over 1,000 sq. miles.

Within each zone is a nominated main railhead, with two or more sub-railheads, generally not more than 20 road-miles from the main railhead, and so chosen as themselves to be the strategic centre of a nominated section of the zone. Apart from the railheads and sub-railheads, all other stations in the zone are closed for "smalls" traffic, except for such as may be carted by the public.

In so far as, by pre-arranged schedules or by subsequent traffic development, full wagon-loads can be made from a sub-railhead—either to destination railhead or sub-railhead—all collections are focused on and loaded at the sub-railhead. Traffic arising within a sub-railhead area for which through wagon-loadings are not, or cannot be, provided at the sub-railhead, is conveyed by trunk-haul road lorries to the main railhead in the zone for direct loading to destination railhead or sub-railhead.

### Trunk Road Motor Services

These trunk road motor services are scheduled to ensure that all traffic collected is loaded away the same evening from the main railhead; by this means, intermediate rail transshipment is eliminated, and the service given to the public improved by at least 24 hours.

Although substantial advances can be achieved domestically within one railway system, the fullest benefits cannot be derived until the zonal scheme operates broadly through the whole country.

The efficacy of the scheme depends largely upon the efficiency of the cartage organisation and the availability and selection of the right type of road motor vehicles. Both on road trunk haulage and direct collection or delivery work, the articulated type of vehicle, ranging from two-ton to eight-ton capacity, with appropriate trailers, is most suitable.

The question of costs has been carefully studied. Each individual section of the scheme has been carefully costed, and experience proves that, while in the agricultural and semi-industrial areas some increased costs result, in the industrial areas

(Continued on page 72)

\* Abstract of a paper presented to the Institute of Transport on January 13



## The Coal-Fired Gas Turbine Locomotive\*

*Progress reported by the Locomotive Development Committee of Bituminous Coal Research Inc., in the development of the fuel system*

AS a result of the rapid development which has taken place during the last few years, the open-cycle gas turbine has become a practical proposition as a locomotive prime mover. The added incentive of the possibility of using bituminous coal as the fuel, supplied the economic motive for the programme on which the Locomotive Development Committee is now engaged.

The operation of the gas turbine already has been explained adequately in many recent publications, although the possibilities of its use with solid fuel are only now being explored. The single turbine system, which uses one turbine to drive the compressor and also to supply the useful load, must use a transmission similar to that employed for the diesel locomotive. If a split turbine system is employed, in which one turbine drives the compressor and another supplies useful load, direct drive becomes possible, although reversing means must also be supplied.

In developing the programme of the Locomotive Development Committee, it has been decided to use the conventional direct-current transmission which has demonstrated its reliability so thoroughly in diesel-electric locomotives. The simplicity and ready availability of the component parts of this system are considered sufficient advantages to overcome its high weight and cost. Speed control, reversing, and regenerative braking are all readily attained with this system, and consequently it can be expected that many gas turbine locomotives will use it. In establishing a programme, it was found that all four major turbine manufacturers in the United States were prepared to design locomotives which could meet railway requirements of space and weight. Consequently, the first year of the committee's activities has been devoted entirely to developing a coal-handling system which can be applied directly to the locomotive.

### Method of Feeding and Pulverising Coal

An obvious method of employing the heating value of coal in a turbine is to gasify the coal and burn the resulting gas in a combustor. However, the process of gasification is very slow, and no equipment has yet been developed by which the complete conversion of coal to gas can be done within the space requirements of a locomotive.

If a pulverised coal producer could be developed with the additional development of a means of removing fly-ash, so that the products of combustion would be clean enough for immediate use, it would find a very ready application both to the gas turbine and to many other industrial uses. Consequently, a pulverisation device is now being studied.

To meet practical requirements, coal of regular locomotive size and quality must be dried, crushed, and pressurised at rates up to 8,000 lb. an hour. It must be fed at a controlled rate from the pressurised storage tank into an air line, pulverised to the finest practicable size, and delivered

to the combustor at a gauge pressure of approximately 60 lb. per sq. in. The method of pulverisation which is under active consideration is the air-operated coal atomiser.

This simple device requires approximately 1 lb. of air per lb. of coal at a pressure about 80 lb. per sq. in. above the combustor pressure. This air must be supplied by a small auxiliary compressor, which will take about 1.5 per cent. of the shaft output of the gas turbine.

In order to make the coal suitable for use with the coal atomiser, it must be crushed and dried, so that it can be fed from the pressurised storage tank. Since large quantities of waste hot air are available from the turbine exhaust, it seems logical to use this air for drying the coal, and also for conveying the coal after it has been crushed. The dried and crushed coal must then be put under pressure.

A number of possible methods exists, including the twin-tank system, the lock hopper, and the coal pump. With the twin-tank system, while one tank is delivering coal under full pressure to the atomising air line, the other is isolated from this line, and is being fed with coal from the conveying line. Because of its simplicity, this system is likely to be used in the first coal-burning gas turbine system.

The feeding of the crushed coal from the pressure tank into the atomising air line has in the past been done by means of a small screw feeder operating at variable speed. Because the screw feeder, particularly at low speeds, is not too reliable, a drum-type feeder will also be investigated for this service. Such feeders have been used widely in the chemical industry for controlling accurately the feed rate of granular materials.

Since the accurate control of the rate of fuel flow is of paramount importance in

gas-turbine operation, it is probable that a secondary control system also will be developed. In this system, the screw feeder would deliver the crushed coal through a rotary screen, which would serve to eliminate oversized particles. The atomising air, supplied from the booster compressor at a gauge pressure of 120 to 140 lb. per sq. in. and at a temperature as high as 600° F., picks up the coal from the feeder and carries it up to the recirculator control valve. When full coal flow is required, this valve is opened, and the coal thus passes to the coal atomiser and the combustor (Fig. 1).

### Rate of Coal and Air Flow

A coal flow-meter probably will be used to give continuous indications of the rate of coal and air flow. If, because of a sudden dropping of the load from the turbine, the fuel must be shut off instantaneously, the re-circulator valve is closed, and the coal-air stream is directed through the cyclone separator. The coal is thus separated from the air and returned to the feed tank. The air passes on into the combustor and thence to the turbine. Intermediate settings of the control valve will result in the by-passing back to the tank of any desired portion of the fuel. The master control of turbine power in this system would be the re-circulator control valve, and this would be air-actuated through the governing system.

Pulverisation of coal can be accomplished by a number of different devices. On a locomotive, however, the problem is complicated by the fact that it is desirable for many reasons to pulverise the coal while it is at full operating pressure. The Locomotive Development Committee has under active study the coal atomiser, a device first used at the Institute of Gas Technology in Chicago to produce finely pulverised coal for gasification. It consists simply of a nozzle (Fig. 2) which is inserted into a line through which flows compressed air at a pressure about 80 lb. per sq. in. above the discharge pressure.

By causing the coal to pass through the nozzle with the air, pulverisation can be

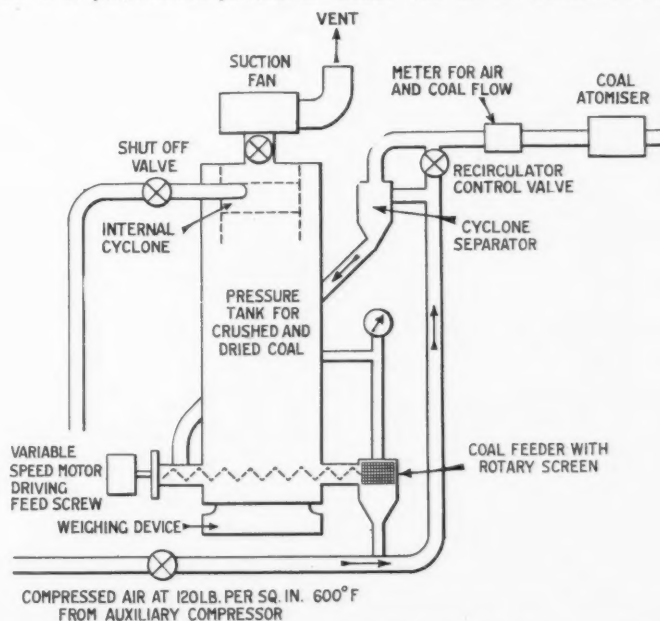


Fig. 1—Proposed system for controlling the fuel fed by the recirculation method

\* Summary of an article by the Director of Research, John I. Vellott, and the Assistant to the Director, Charles F. Kottcamp, of the Locomotive Development Committee, Bituminous Coal Research Inc., published in the *Railway Age*

accomplished through the tremendous number of internal explosions which take place when the air trapped in the pores of the coal seeks to expand as the pressure is reduced. It is expected that the quantity of air required for this process can be kept below 1 lb. per lb. of coal. Because of its simplicity and lightness, the coal atomiser appears to be the most suitable method of pulverisation which yet has been proposed.

#### Design of Combustors

Fundamental research on the burning of coal under pressure is being pursued actively, and a large-scale pressure combustion laboratory is being installed at the Dunkirk works of the American Locomotive Company. The gas turbine combustor is unique in that the amount of excess air is far greater than that encountered in any other fuel-burning device. In order to reduce the temperature of the products of combustion to a value of approximately 1,300° F. (705° C.), which can be used successfully with available materials, six or seven times the air necessary for complete combustion must be supplied.

If an attempt were to be made to burn the fuel directly in the total supply of air, the flame would be so chilled that the combustion efficiency would be very low, and the flame might even be extinguished. Consequently, it is necessary to have an inner form of combustion chamber within which coal is burnt completely with about 40 per cent. excess air.

The remaining air is used to cool the internal-combustion chamber and mix with the products of combustion after they emerge from this chamber. Heat releases as high as 2,000,000 B.Th.U. per hr. per cu. ft. have been recorded with this type.

Another type of combustor, based on the Vortex combustion chamber, originally proposed as early as 1931 by the Fuel Research Board of Great Britain, is now being tested. A heat release of 4,000,000 B.Th.U. per hr. per cu. ft. has been obtained with this unit, and it therefore appears to have excellent possibilities for use as a gas-turbine combustor.

#### The Fly-Ash Problem

The removal of fly-ash from the products of combustion is a matter of the utmost importance. If the ash is not removed, the gases are extremely abrasive even to the hardest materials now employed for turbine blades. If, however, the fly-ash is removed to such an extent that only 5 to 10 per cent. of the original dust loading remains, and all particles above 10 microns (0.025 in.) are removed, then the abrasiveness of this air-dust suspension is reduced to the point where it is not expected to be harmful to the gas turbine blades.

The use of a battery of small cyclone separators appeared at the outset to be the only practical solution of the problem. In co-operation with the Aerotec Company and the Thermix Engineering Company of Greenwich, Conn., a programme of investigation has been carried out which shows that the small cyclone separators produced by these companies can meet the requirements of gas-turbine service.

It has been demonstrated that the Aerotec tube can remove as much as 95 per cent. of the fly-ash in the hot-air stream. However, in order to keep the pressure loss between the combustor and turbine down to about 1 lb. per sq. in., it is necessary to establish a compromise resulting in removing 90 per cent. of the fly-ash.

Two turbine sets are now on order, one from Allis-Chalmers, and the other from the Elliott Company, and delivery is ex-

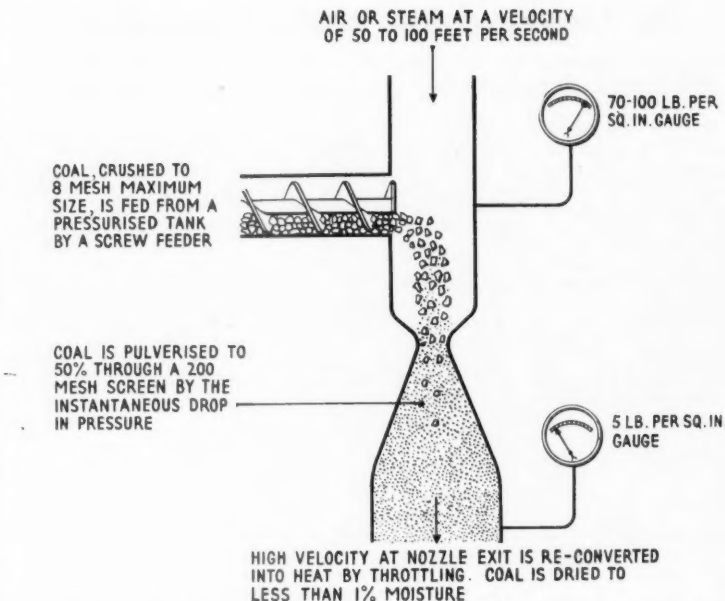


Fig. 2—Coal atomiser for pulverising the crushed fuel as it is fed towards the combustion chamber

pected late this year. Each turbine will be capable of producing at least 3,750 shaft horsepower, and the full-load coal consumption of each is considerably less than 1 lb. of 13,500 B.Th.U. coal per shaft h.p. hr.

The Allis-Chalmers unit uses the axial compressor. The efficiency of similar compressors has been reported as high as 85 to 86 per cent. Five stages of reaction blading will be used in the gas turbine, and four 1,000-h.p. generators will be driven at approximately 1,000 r.p.m. by a single reduction gear.

The Elliott turbine will employ a two-stage centrifugal compressor, which will enable the unit to be built with only two bearings. Because of its unique design, the Elliott unit will eliminate high-pressure seals, thus compensating in part for the lower compressor efficiency which is to be expected from the centrifugal design. The Elliott unit is characterised by extreme lightness, since the prime mover and generator together will weigh only about 17 lb. per h.p.

#### Design of Turbine Locomotives

The actual design of locomotives to use the Allis-Chalmers and the Elliott turbines will be undertaken in the near future by the three major American steam locomotive builders. The locomotives will be double-ended, thus eliminating the necessity of turning them at the end of a run. A maximum range, without refuelling, of 1,000 miles will be provided.

A train-heating boiler of conventional type will be used, and the oil supply for this boiler will be used also as pilot fuel in the main combustor, and as fuel for the small auxiliary diesel engine which will be used to start the main turbine. The conventional direct-current transmission system will be controlled by the engineman in a manner similar to that now used on diesel-electric locomotives.

Wind-tunnel tests will be conducted in the near future to decide the best shape for the locomotive, bearing in mind that approximately 100,000 cu. ft. of air per min. must be taken in to supply the main turbine and the traction motor cooling re-

quirements. Induction of this air at the proper place on the surface of the locomotive may result in a useful reduction of the power output required at high running speeds.

#### The Transhipment of Goods Train Traffic

(Concluded from page 70)

substantially decreased costs follow from wage and clerical economies resulting from the concentration effected.

With the completion of the terminal re-organisation of the work, there must follow a review of freight-train working designed to provide, as between the residual selected depots, the fullest benefits of scheduled vacuum-fitted express freight services. It is anticipated that an economy both of wagons and possibly of engine-power will result.

To preserve the perspective in relation to the whole, it should be stated that, based on an analysis of originating freight traffic carried by all companies for the week commencing March 27, 1939, the proportion of "smalls" to total tonnage was 0.026 per cent., and to total receipts, 0.124 per cent., while the proportion of "smalls" to tonnage of general merchandise in classes 11 to 21 of the Railway Classification was 14 per cent. in respect to tonnage, and 32 per cent. in the case of receipts.

So far as full wagon-load traffic is concerned, the most notable development between the wars was the railway container, which possessed both advantages and limitations from the railway viewpoint. It possessed advantages, notably, in the elimination of transhipment, while the primary disadvantage has been its limitation of capacity loading.

I envisage a substantial development of container loadings in the future. Indeed, it is not improbable that provision will require to be made for special container yards at the larger stations, and I see no reason why trainloads of container flats should not progressively work in scheduled services between large centres.

## G.W.R. Plant Demonstration Train

*Object and organisation of the tour, and details of some exhibits*

*By E. J. M. Matheson, B.Sc., A.M.I.C.E., A.C.G.I*



*Demonstration of a Liner cross-cut petrol saw during the visit of the train to Bristol*

THE ordered development of railway civil engineering maintenance was hindered during the war. New appliances, of course, were introduced, but their main purpose was to cope with immediate problems, and their broad application was sometimes neglected. At the same time, arrears of maintenance arose, and still exist, the rapid reduction of which clearly calls for a review of modern equipment in the light of its possible use in railway work; it is also essential to make the most efficient use of the limited manpower available, and reduce the amount of heavy work to be undertaken manually.

The Engineering Department of the Great Western Railway has recognised that, in the past, one of the main bars to progress was the natural human instinct to resist change, and that innovations stand more chance of a fair trial and ultimate success if they are received enthusiastically in the first place. It was considered that if selected members of the Engineering Department staff could see and handle modern equipment, a demand for it might be created, and a condition of "plant mindedness" induced such as would be complementary to, and vastly increase, the effectiveness of new ideas.

The original plan was to stage a demonstration and exhibition of tools and plant at some central point to which men would come from all parts of the company's system; it soon became apparent, however, that considering the large number of the staff who would benefit by a visit to the exhibition, the alternative of taking the exhibition to the visitors was to be preferred. A selection of suitable exhibits was, therefore, loaded on a special train of eighteen vacuum-fitted vehicles including a camp coach and water tank wagon.

The company's Inspector of Portable Plant, with five assistants, one of whom undertook the additional duty of cook, formed the nucleus demonstration staff and took up their residence in the camp coach. Every week-end the train moved to a different part of the system, where a

demonstration site had been prepared specially by the Divisional Engineer concerned; Mondays were spent in unloading the exhibits, and training local operators as demonstrators, and visitors were received on the following four days.

The exhibition visited Reading, Plymouth, Bristol, Neath, Cardiff, Newport, Wolverhampton, and Central Wales, finally returning to the G.W.R. creosoting depot at Hayes, where it had been originally assembled.

### Arrangements for Visitors

Three thousand selected members of the company's Engineering Department staff of varying grades saw the exhibition. Many obviously were sceptical at first, but most were convinced enthusiasts before they left in the afternoon, and already results are more than justifying the scheme. Some senior inspectors from

other railways also have been among the visitors.

In some localities, as many as 150 visitors were handled each day, and it was the aim of the staff to give every one as much individual attention as possible. The visitors were split into small parties, and as the number of demonstrators was limited, a complex organisation and programme had to be evolved and strictly followed.

At every site, the layout of the exhibition naturally varied, as did the number of visitors, their time of arrival, and arrangements for meals, and the programme had to be varied to suit these conditions. The collaboration of local canteen managements was sought, and in one case, that of the British Restaurant, because it was felt that a good meal, especially for those who had travelled a long distance, would be of material assistance.

### Round the Exhibits

The exhibition lasted for nine weeks, finishing on December 4, 1946, when Mr. A. S. Quartermaine, the company's Chief Engineer, took down to Hayes a party consisting of the chief engineers of the other railways, some of their senior assistants, and officers and representatives of other departments of the G.W.R.

In general, the greatest interest was aroused by the Mawdsley portable 3-kW. generator, which drives electric hand tools of various types. Other exhibits comprised a smaller generator with floodlights, a compressor with pneumatic tools, an electric hedge trimmer, various pumps, a grout mixer for pressure track grouting, the Warsop petrol pick, the Johnson power rammer, the John Bull rail drill and saw, a small concrete mixer, a motor hoe for cutting fire breaks, a motor scythe, a belt loader, a small mechanical excavator, cranes of 2-ton and 15-cwt. capacity, light steel trestling, Drivall equipment, a pipe-forcing jack, hand rail cutters, drain cleaning apparatus of two types, and a track slewer. Some of the equipment demonstrated is described in the following paragraphs and a selection of the more interesting of the other exhibits will be dealt with in succeeding issues.

*Mawdsley generator.*—The assembly of point and crossing work alongside the line or in its final position, usually involves a large amount of hand bor-



*Mawdsley electric generator, and some of the tools which are issued with it. The tools shown are (from left to right) a wood planer, rail drill, 9-in. timber saw, hammer, and nutrunner*



ing of the timbers to receive the fang-bolts or coach screws. Only in exceptional cases has it been possible to get a compressor sufficiently close to permit of the employment of pneumatic augers, while the current for electric tools is available normally only in pre-assembly yards.

The Mawdsley 3-kilowatt generator illustrated has been developed by the manufacturer, Mawdsley's Limited, of Dursley, Gloucestershire, in close consultation with the Great Western Railway Engineering Department; it enables an electricity supply sufficient to drive, say, three or four augers simultaneously, to be made available anywhere on the permanent way.

#### Lightweight Generator

The size of the generator can be gauged from the illustration on page 73 and it contrasts favourably with the bulky compressor and cumbersome hoses which would be required to perform equivalent work. The present generator weighs about 4 cwt., and future machines will weigh somewhat less than 400 lb. It can be transported by four men using the lifting handles incorporated in the cover. The prime mover is a 350-c.c. Douglas petrol engine, operating at 3,000 r.p.m., in which special attention has been paid to silencing as a safety measure for work on the permanent way. The voltage of the new machines is to be 110 V. a.c., with a connection to earth ensuring that the maximum voltage thereto does not exceed 55 volts.

Wood augers, a rail drill, hammers, nutrunners, a wood planer, and a small circular saw were demonstrated with the generator, and are to form part of the equipment with which the generators are to be issued in the future.

**Auto Diesels electric generator.**—This 110-volt d.c. generator is of 1 kW. capacity, and is manufactured by Auto Diesels Limited, of Uxbridge, Middlesex. The prime mover is a Norman petrol engine developing  $2\frac{1}{2}$  h.p. at 1,500 r.p.m., and it is suitably silenced. The complete unit, mounted on caterpillars, weighs 378 lb. The illustration shows, also, two 500-watt floodlights on tripods, with telescopic masts, which can be operated by the generator simultaneously; alternatively, a portable electric wood auger can be used at the same time as one floodlight, or the generator can operate tools alone up to its capacity. Floodlights can be operated also by the Mawdsley generator.

**Concrete mixer.**—The railway engineer frequently is called on to carry out small jobs involving, say, 4 or 5 cu. yd. of concrete; in such cases, it may be that only the larger types of mixer are avail-



Auto Diesels 1-kW. electric generator, with floodlights



Rex 5/3½ concrete mixer with tilting drum

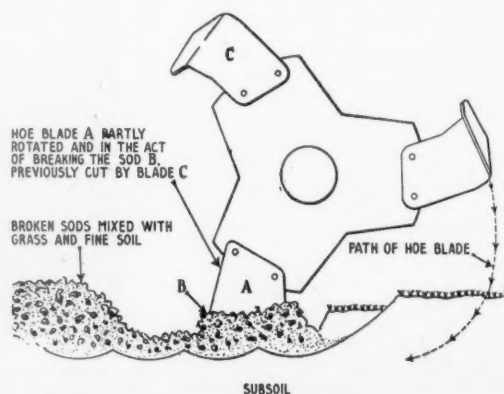
able, and considerable effort would be involved in getting one of them to the site, or the site may be restricted. The alternative is hand mixing, which is unsatisfactory and expensive. The 5/3½ Rex mixer with tilting drum, weighing just over 9 cwt., is the smallest type in the possession of the Great Western Railway, and is manufactured by Blaw Knox Limited, of Clifton House, Euston Road, London, N.W.1. As can be seen, the mixer, with

cement, aggregate, and water, can be loaded on one wagon, and a small job adjacent to the track can be carried out under a "between trains" occupation of the line without even unloading the mixer; for example, concreting-in a series of cant or centre-line monuments after curve improvements have been carried out.

**Gem rotary hoe.**—The Gem rotary hoe, marketed by Geo. Monro Limited, of Waltham Cross, Hertfordshire, is driven by



Gem rotary petrol hoe



Operation of hoe blades



*Steenbrugge track-slewing machine*

a 6-h.p. petrol engine. This machine is used principally for cutting "fire breaks" alongside the railway boundary in order to minimise the danger of accidental embankment fires spreading to bordering arable land, but has been used also to good effect in opening up the surface of ash cesses to improve drainage and keep down weeds. The action of the rotary cutters is shown diagrammatically. There are three forward gears for the wheels, and an independent gear for the rotor.

#### Rotary Hoe Capacity

The width of cut is 1 ft. 8 in., and the maximum depth of 8 in. can be reduced to the extent required by raising an adjustable skid at the rear of the machine. If the maximum cut of 8 in. is made on heavy ground covered by a layer of grass, several trips may be necessary to break up the ground, but a satisfactory "fire break" may be obtained with a 2-in. depth of cut, involving one trip only provided the broken-up turf is removed by a man with a shovel following the machine.

A width of 2 ft. 6 in. is desirable to operate the hoe. The handlebars can be slewed to enable the operator to control the machine from the side when working under a hedge. The machine climbs slopes.

*Steenbrugge track-slewing machine.*—Normally, a tip siding receives the minimum of maintenance consistent with the avoidance of derailments. The sleepers sink into the mud, and slewing by normal methods involves laborious opening out of the sleeper ends or jacking up the track. The machine manufactured by Steenbrugge

& Co. Ltd., Ace of Clubs, Abbey Road, Knaresborough, Yorkshire, is designed specially for slewing on tips. It consists essentially of a four-wheel trolley, from each side of which clips can be dropped to engage the underside of the rails. From the trolley, a broad-based pillar is lowered between the sleepers by means of a rack and pinion, and on coming into contact with the ground, raises the trolley and the track to which it is clipped until the sleepers are well clear of the formation. While pawls hold the original pinion, a second rack and pinion move the whole contrivance sideways. A safe slew is 20 in. The machine weighs 12 cwt. The Steenbrugge track-slewing machine is not necessary in cases where wagons on the tip are unloaded by means of the type of truck discharger fitted with a track-slewing device.

#### Light-steel trestling.

Although not strictly an item of mechanical equipment, it was considered worth while demonstrating light-steel trestling, and sufficient components were carried on the train to erect on each

demonstration site a pier 15 ft. high. The trestling was evolved by the War Office and used by the army in all the principal theatres of operation during the recent war.

The Great Western Railway acquired a quantity of the trestling for emergency use, such as is depicted in the illustration below where a temporary tower has been erected for the support and repair of one of the arch ribs of Paddington Station roof damaged during an air raid. The advantages of the trestling include the relatively light weight of the individual components (maximum 6 cwt.), which enables a pier to be built quickly by six or seven relatively unskilled men without the aid of anything more complicated than a hand winch; the ability to increase its carrying capacity to anything that will be required in practice by increasing the number of bays (5 ft. square) in which the trestling is constructed; the selected lengths



*Light-steel trestling in use for air-raid damage repairs at Paddington*

of the vertical components, which enable trestles to be of varied heights in multiples of 1 ft.; and the fact that it can be reused indefinitely.

**VISITS OF BUSINESS MEN TO GERMANY.**—The Board of Trade states that arrangements have been made to allow business men to visit the British and American Zones in Germany for commercial purposes. On account of the limited facilities in accommodation and transport, applications can be considered only from persons having a specific purchasing transaction in view. Applications should be made in the first instance to Sundry Materials Branch, Board of Trade, 10, Old Jewry, London, E.C.2. They should be accompanied by firm inquiries for specific goods and the names of the German suppliers with whom it is wished to deal. Some evidence, such as correspondence with the German suppliers concerned to show that they are in business and may be in a position to produce the goods, also should be given. The appli-

cation should give reasons why a visit to Germany is considered desirable. Imports from Germany will continue to be handled by Sundry Materials Branch.

**SWEDISH DELEGATION VISITS LONDON TRANSPORT.**—A delegation from Stockholm County Council visited London Transport on January 7 in connection with the building of an underground railway in Stockholm. The five members are studying the general structure and service of tube railways, the building and general layout of tube stations, technical equipment, method of construction, and questions of supply. They are also collecting information on street traffic problems, traffic signals, parking, the construction and maintenance of streets, road bridges, and road tunnels.

**LONDON TRANSPORT TO SPEED TUBE CONSTRUCTION.**—London Transport intends to double its labour force working on the Eastern Extension of the Central Line tube between Stratford, Newbury Park, Loughton, Hainault, and Ongar. The first section of the line was opened between Liverpool Street and Stratford last December, as recorded in our December 6 issue. At present, nearly a thousand men are working on the remaining sections of the line. London Transport now intends to take on a further 1,100 men, including 500 labourers for the Signal Department, 100 labourers for the permanent way, 250 mechanical installers, and 250 electric-circuit installers for signalling. A special recruiting centre is being opened at Drapers Field, Leyton, so that the new men can be directed immediately to the job.

## Ambulance Van for the Victorian Railways

*A new vehicle fully equipped for treating casualties or performing operations at the scene of an accident*



**A**N ambulance equipment van designed by officers of the department has been brought into service by the Victorian Railways Commissioners. It is a hospital on wheels and would prove an invaluable first-aid and medical attention base in the

event of a train accident involving personal injury. The ambulance could be rushed by road to the scene of a train mishap, and immediately on arrival would become the base for first-aid treatment, or serve for a major operation.

The body of the ambulance has been built on the chassis of a lend-lease Ford 3-ton, 4-wheel drive lorry. One wall lifts from the outside in three flaps, forming a roof. It discloses three cupboards, two of which are identical and also contain dressings, drums, antiseptics, and complete emergency medical kits, including amputation saws, artery forceps, probes, and scalpels.

### Equipment Easily Accessible

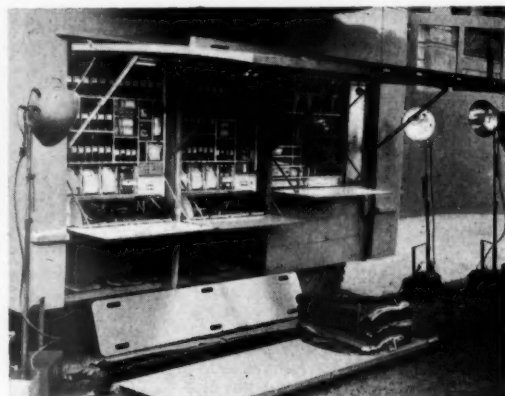
The third cupboard holds basins, sterile towels, soap, a 3-gal. container of boiling water, and various vessels. Being on the outside of the van, the three cupboards are easy of access and permit a number of doctors to operate simultaneously. All bottles are numbered, instruments fit into clips, and no item is concealed behind any other item.

Inside the ambulance, in readily accessible cupboards, is a variety of medical stores. There are six portable cabinets each containing first-aid requirements, which can be carried direct to casualties, a dozen stretchers, large numbers of splints, spine-boards, blankets, towels, supplies of bandages, extra dressings, and compartments for hot water and tea. A canopy can be erected over the whole ambulance, enclosing it within its own tent.

Lighting comes from six reflector lamps as well as from lights built into the van. A large number of portable hand lights is carried.



*Ambulance equipment ready for use, with tarpaulin extended to form a tent for doctors and patients*



*Left-hand wall of van with cover open to form a canopy and give access to the medical stores*

**RECOVERY OF "PLUTO" PIPELINE.**—The work of unloading the "Pluto" pipeline, which delivered petrol from this country to the Allied armies on the Continent, is being carried out at Southampton Docks, Southern Railway. The cable ship *Empire Ridley*, which assisted in the original laying of the pipeline, is being employed in reclaiming it from the Channel. Nearly 80 miles of salvaged pipeline are delivered on to the special dock site on each trip. Unloading is effected by means of pylons more than 50 ft. high, over which the cable is drawn up from ship to shore by means of electrically-operated sheaves or pulleys. As it descends, a gang manoeuvres it to form two coils, 50 ft. in diameter and 16 ft. high. The total length of cable in each coil will be about 30 miles. We understand that subsequently this cable will be cut into standard lengths on site for eventual des-

patch by rail. The salvage operations, moreover, are expected to extend over at least a year.

**IMPORTS OF FLOWERS FROM THE RIVIERA.**—Early cut flowers grown out-of-doors on the French Riviera are now arriving in this country at the rate of two or three tons daily. They are carried across France by rail in insulated and ventilated railway vans. By this means the flowers arrive here perfectly fresh after a journey of from three to four days from the South of France. The British Government has authorised the importation of a total of 500 tons up to February 15. This is equal to about 20 per cent. of the pre-war traffic. A selection of some of these Riviera flowers was on show last week at the offices of French Railways Limited, 179, Piccadilly, London, W.1.

**RAILWAY STOCKHOLDERS JOINT COMMITTEE.**—The British Railway Stockholders Union and the L.N.E.R. Stockholders Association announce the formation of the Railway Stockholders Joint Committee, to organise the strongest opposition of all railway stockholders to the Transport Bill. The joint committee is constituted as follows: Sir Charles Stuart-Williams (Chairman), Mr. Ernest Short and Major Russell Croft (British Railway Stockholders Union); Mr. Kenneth Scott Adie, Mr. Austin E. Kavanagh and Air Commodore C. J. R. Turner (L.N.E.R. Stockholders Association). Air Commodore Turner and Major Croft will act as Joint Secretaries of the committee, with offices at 25, Victoria Street, London, S.W.1 (telephone: Abbey 1193). Protest meetings against nationalisation are being held in Glasgow on January 20, Leeds on January 22, and Birmingham on January 24.



## New Streamline Trains in U.S.A.

*Aluminium-alloy coaches save about 34 per cent. in weight as compared with conventional heavy-steel construction*



*Coach interior with smoking lounge in foreground*

THE first of four post-war streamline trains built for the Louisville & Nashville Railroad by the American Car & Foundry Company at its St. Charles, Missouri, works was delivered on November 1, 1946. The remaining streamliners are well on the way to completion, and it is expected that all four trains will be placed in regular service shortly.

After an exhibition tour, two of the trains—"The Humming Birds"—will be placed in service on fast day runs between Cincinnati and New Orleans, and the other two—"The Georgians"—will operate between St. Louis and Atlanta, using the Nashville, Chattanooga & St. Louis Railway between Nashville and the Georgia capital. As will be seen from the illustrations accompanying this article, these trains incorporate the latest in modern travel comfort.

### Use of Aluminium Alloy

Each train will consist of one lounge coach, two *de luxe* coaches, diner, tavern-lounge coach, and two partition coaches, the dimensions common to all types of coach being 85 ft. in length, 10 ft. over side posts, and 13 ft. 6 in. roof height above rail. By the use of aluminium alloys, the basic weights of these coaches will represent a saving in weight of approximately 34 per cent. in comparison with equivalent coaches of conventional heavy-steel construction.

All the coaches were designed specially to meet the operating requirements of the Louisville & Nashville Railroad, and the details were worked out by the Department of Industrial Design of the A.C.F. The coaches are so designed that they will appear as a unit streamline train, this appearance being aided by the exterior colour treatment of a near-royal blue in continuous horizontal panels interspaced by flutings above and below the windows, each coach, in turn, being individually set apart from the others by its own distinctive name in gold on a field of blue arranged on the sides of the individual coaches.

Each *de luxe* coach seats 60 passengers, and possesses features ensuring every

luxury and comfort, including deep reclining and revolving seats, large full-vision windows, roomy luggage racks with individually-controlled fluorescent lighting recessed in the bottom of the luggage racks at each seat, loud-speaker system for station announcements, music, etc., and spacious washrooms.

In addition to the individually controlled fluorescent lights at each seat, the general coach illumination includes soft, restful, rectangular wells of light recessed in the ceiling, giving direct light to the aisles, which, in turn, are flanked on either side by continuous air diffusers which provide an outlet for the conditioned air. The colour scheme has been developed in varying shades of red and brown set off by a pale ivory ceiling.

The partition coaches are a counterpart of the *de luxe* coaches in interior appointments, colour scheme, etc., and seat 58 passengers, space for 10 of whom is arranged in a lounge section complete with individual chairs, reading lamps, etc.

The tavern-lounge coach is arranged in two sections. The lounge section seats 28 passengers, and is separated from the tavern section by a bar; the tavern section seats 24 passengers. At the end of the coach are washrooms, lockers, and an office which houses the loud speakers and amplifier system controls.

The lounge section achieves a club-like atmosphere with its intimate grouping of comfortable chairs interspersed with two-seat sofas. Windows are arranged for the fullest vision possible. The colour scheme here is warm and pleasant, shades of light reds in the carpeting blending into the chaise longue and rust set-out in the lounge chairs. Medium light green is carried through the wainscot, with a lighter shade of green above the windows, terminating in a cream ceiling. Dark tan curtains are divided at intervals with horizontal stripes of red to simulate venetian blinds.

A stainless steel kitchen and pantry occupies one end of the coach. The middle portion presents a foyer with access to the dining room. A full-height square-etched panelled mirror, from floor to ceiling, on the partition at the pantry replaces the

customary sideboard, tending to increase in depth the dining room which adjoins the foyer and seats 48 passengers, arranged around 12 dining tables.

Each coach embodies the same basic construction designed to meet United States Post Office as well as A.A.R. specifications for the construction of new passenger rolling stock. All materials used in the coach framing are aluminium alloys, with the exception of the bolsters, cross-bearers, and end sills, which are of low-alloy high-tensile steel. The cast-steel integral buffer casting extends through the bolster, and all are assembled by riveting. Special extruded aluminium-alloy sections are used for framing members.

### Constructional Features

The side frames are of girder construction. The side sills are of special extruded aluminium alloy, with a vertical web to which the side posts are attached as well as having integral flanges for supporting the floors; the side sheets and posts are attached to a special extruded aluminium-alloy tee, in turn attached to the extruded side sills.

The horizontal lines of rivets in the side-frame construction above and below the windows are concealed by aluminium-alloy aluminized snap-on mouldings running the full length of coach and closed at the ends by matching cast-aluminium end covers. The exposed vertical lines of side-frame rivets have a low oval-head rivet of special design.

For end-frame construction are used two 8-in. aluminium-alloy extruded I-beam sections with a web thickness in the lower portion to meet the A.A.R. sheer resistance requirements. The intermediate end posts are 3-in. aluminium-alloy "Z" shapes and the corner posts a special extruded aluminium section.

The roof frame is made of 3-in. aluminium alloy extruded "Z"-section carlines with five lines of extruded "Z"-section purlines. The roof sheets are of aluminium alloy riveted to the framing with aluminium mushroom-head rivets. The longitudinal floor stringers are aluminium alloy "Z" shapes supported on underframe cross-members. Keystone floor sheets  $\frac{1}{4}$  in. high are applied to the longitudinal stringers, the upper grooves being filled with lightweight composition flooring.

Both ends of all the coaches have sheet-rubber closures following the outside contour and forming a continuous line when the coaches are coupled.

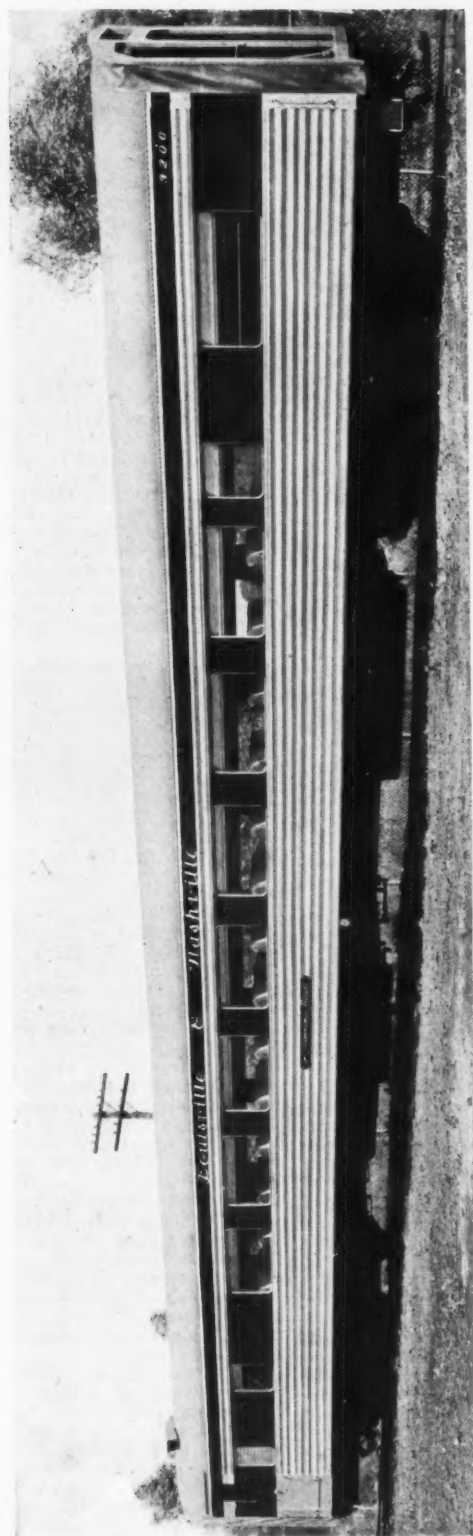
Westinghouse H.C.S. electro-pneumatic brakes with D.22 control valves are applied on all coaches. Each bogie has two brake cylinders centrally located in each side with Simplex clasp-brake equipment.

Safety jet-stream air-conditioning equipment with vapour controls, mounted under the coach, supplies air to the coaches, and is of 7-ton capacity. The conditioned air is distributed uniformly through two diffusers running the length of the coach beneath the ceiling.

Four-wheel bogies are used on all coaches, with  $5\frac{1}{2}$  in. x 10 in. journals, and equipped with Hyatt roller bearings. The 36-in. rolled-steel wheels are ground after mounting to give better riding qualities. The bogies are of the single-drop equaliser type with Commonwealth alloy cast-steel frames having pedestals cast integral. Both equalisers and bolster springs are of helical coil design in alloy steel. Vertical motion is controlled by Monroe shock absorbers and the bogie bolsters are restrained by rubber-cushioned bolster anchors.

## New Streamline Trains in U.S.A.

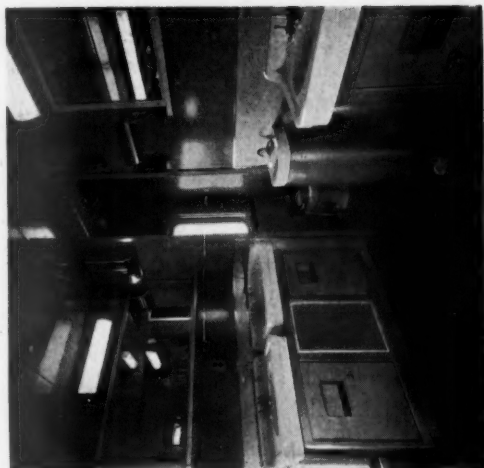
(See article on previous page)



One coach of the streamline train "The Humming Birds" built for the Louisville & Nashville Railroad by the American Car & Foundry Company



Men's lounge



Washroom in the men's lounge



Ladies' lounge

## RAILWAY NEWS SECTION

## PERSONAL

Lord Latham has been re-appointed a member of the London Passenger Transport Board for a further three years from January 20, 1947.

Mr. Percy Acton Clews, European Manager, Canadian National Railways, who, as recorded in our January 10 issue, is retiring on January 19, was born at Rock Ferry, Cheshire, on January 19, 1882, and joined the Grand Trunk Railway at Liverpool in 1907. He was appointed London City Agent and Acting Agent, Antwerp, Belgium, in 1910, and Assistant to European Traffic Manager in 1919. On the consolidation with Cana-

the Central Bank of Argentina, in charge of Union Telephone Affairs; Señor José Terza, Assistant to the Secretary of the Board of the Central Bank of Argentina; Señor Jorge Alvarez, of the National Railway Board; Señor Roberto Ares, Director-General of Economic Matters, Ministry of Foreign Affairs; and Señor Oscar Pelliza, Chief of the Political & Economic Section, Ministry of Finance.

Mr. H. N. Edwards has been appointed a Special Director of the Metropolitan-Cammell Carriage & Wagon Co. Ltd., as from January 1, 1947. While Mr. A. J. Boyd, Managing Director, is abroad on the company's business, Mr. Edwards will act on his behalf.

The Minister of Transport has appointed Sir Archibald McKinstry to be the second member of the Road & Rail Appeal Tribunal constituted under the Road & Rail Traffic Act, 1933, for three years from January 1, 1947. Sir Archibald McKinstry is Deputy-Chairman (late Managing Director) of Babcock & Wilcox Limited.

Mr. A. L. Castleman, M.Inst.T., who, as recorded in our January 3 issue, retired at the end of 1946 from the position of District Goods Manager, London, L.M.S.R., entered the L.N.W.R. service at Camden Goods Station, London, in 1901, and subsequently obtained experience in various sections of the Goods and Traffic



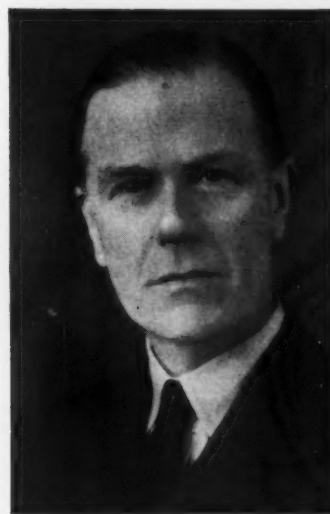
Mr. P. A. Clews

European Manager, Canadian National Railways, 1932-47



The late Mr. G. W. Wyles

Signal & Electrical Engineer, New Zealand Government Railways, 1929-47



Mr. A. L. Castleman

District Goods Manager, London, L.M.S.R., 1929-46

dian National Railways, he was made General Freight Agent in charge of Continental Traffic. Mr. Clews was appointed European Traffic Manager in 1924, and European Manager in 1932. He represented Sir Henry Thornton in the Transportation Section of the League of Nations, and the International Railway Congress. During the recent war Mr. Clews was on the committee of the Canadian Red Cross and Canadian Y.M.C.A., and Vice-Chairman of the Dependents Advisory Board. He acted as technical adviser to the Canadian Government Representative on the United Maritime Authority. He is a Past-President of Canadian Chamber of Commerce in Great Britain, and a Governor of Cranleigh School and Maidenhead Hospital. He remains Chairman of Canadian National Railways (France), which owns the Hotel Scribe building in Paris. On January 21 Mr. Clews is to receive a presentation from the European staff and will be entertained to dinner by officers of the C.N.R.

The Argentine Government recently announced the names of those who will form the technical advisory sub-committee to be set up in accordance with Clause B of the Anglo-Argentine Railway Agreement, as follow: Señor Alberto Fretes (Chairman), Assistant Manager of

Mr. G. W. Wyles, A.M.I.E.E., M.I.R.S.E., Signal & Electrical Engineer, New Zealand Government Railways, whose death we recorded last week, was to have retired from that position next March. Mr. Wyles received his training with the W. R. Sykes Interlocking Signal Co. Ltd., and subsequently became Assistant Engineer to the London & South Western Railway. He was appointed Signal Engineer to the Bombay, Baroda & Central India Railway (broad gauge) in 1907, and to the Rajputana-Malwa (metre gauge) section in 1912. He joined the New Zealand Government Railways in 1916 as Assistant Signal & Electrical Engineer, and was appointed Signal & Electrical Engineer in 1929. Mr. Wyles had contributed articles to *The Railway Gazette*, including that on "Centralised Traffic Control in New Zealand," published in our October 5, 1945, issue. An abstract of his paper read before the Institution of Railway Signal Engineers in January, 1938, on the subject of "Signalling Developments in New Zealand," appeared in our issue of January 28 of that year.

We regret to record the death on January 4, at the age of 71, of Mr. William Crafnant Mould, V.D., sometime Deputy Chief Mechanical Engineer, East Indian Railway.

Departments in London, Crewe, Leeds, Bangor, and elsewhere. In 1913 he was appointed Assistant District Goods Manager, Rugby, transferred to a similar position in the Manchester District later, and to Liverpool in 1919. In the next year Mr. Castleman was appointed Assistant to Outdoor Goods Manager of the Northern Division, and in 1922 became Assistant to the General Superintendent in Manchester. Towards the end of 1923, he was appointed Acting District Goods Manager in Manchester for both L.N.W. and Midland sections of the L.M.S.R. In 1925 he became District Goods Manager at Warrington, and in the same year was transferred to the corresponding position in Manchester. Mr. Castleman was appointed District Goods Manager, London, in 1929. He is a member of the executive committee of the British Railway Officers' Guild; a member of the Worshipful Company of Carmen; a Foundation Member, and three times Member of Council, of the Institute of Transport; and first Chairman of the newly-formed Metropolitan Section of the Institute of Transport. He is also Senior Member of the Metropolitan Conference of Railway Companies; Executive Member of the Thameside Development Board; and a member of the Safety First Council. Mr. Castleman's retirement brings to an end



100 years of family connection with transport, as his grandfather entered the service of Chaplin & Horne in the old stage coach days, and his father was a former London District Goods Manager in the days of the L.N.W.R. Mr. Castleman's uncle, Mr. C. Castleman, was Chairman of the L.S.W.R. from 1873 to 1874.

Mr. William Ellerington Bulman, B.Sc. (Eng.) (London), A.M.I.C.E., A.M.I. Mech.E., who, as recorded in our issue of December 27 last, has recently been appointed Chief Mechanical Engineer, Tanganyika Railways & Ports Services, was born in Canada on July 6, 1904, and came to Great Britain in 1916, and went to King Alfred's School, Wantage. In 1921 he became an articled pupil to the late Mr. C. T. Hurry Riches (Locomotive

Presidency, having held office for two years. Sir Frederick Bain is a Deputy-Chairman of Imperial Chemical Industries Limited.

#### C.P.R. CHAIRMAN & PRESIDENT

Mr. D. C. Coleman, Chairman & President, Canadian Pacific Railway, is retiring. Mr. W. M. Neal, Vice-President, is to succeed him in those posts. Mr. G. A. Walker, Vice-President & General Counsel, has been elected Vice-President and a Director. Mr. Coleman remains a Director.

Mr. J. W. Terry, M.C., Indoor Assistant to the Stores Superintendent, Southern Railway, who, as recorded in our January 3 issue, has been appointed Assistant Stores Superintendent, was educated

1926 transferred to the Chief Civil Engineer's Construction Office, returning to the Signal Engineer's Department, L.N.E.R., Liverpool Street, later the same year. In 1936 Mr. Derbyshire joined the Signal & Telegraph Engineer's Department, L.M.S.R., at Euston, as Technical Assistant, and in 1937 was appointed Development Assistant to the Signal & Telegraph Engineer. In 1941 his services were lent to the Ministry of Supply, and he became Deputy Assistant Director of Transportation & Equipment. In the next year he was promoted to be Assistant Director, Directorate of Royal Engineer Equipment. He returned to the Signal & Telegraph Engineer's Department, L.M.S.R., at headquarters, in 1943, and in 1944 was appointed Assistant (Development & New Works).



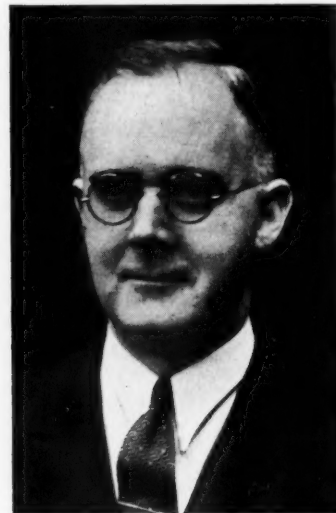
**Mr. W. E. Bulman**

Appointed Chief Mechanical Engineer,  
Tanganyika Railways & Ports Services



**Mr. J. W. Terry**

Appointed Assistant Stores Superintendent,  
Southern Railway



**Mr. C. G. Derbyshire**

Appointed Signalling Assistant to Signal  
& Telegraph Engineer, L.M.S.R.

Superintendent, Rhymney Railway), and from 1924-28 he served with the Great Western Railway. He resigned to join William Beardmore & Co. Ltd., and later was on the staff of the Superheater Co. Ltd. In 1930 he was appointed Assistant Locomotive Superintendent, Tanganyika Railways, and in 1940 he became District Mechanical Engineer, in charge of Dar-es-Salaam workshops. In 1936 Mr. Bulman travelled through South Africa, Rhodesia, the Congo, Angola, Nigeria, and the Gold Coast, to observe railway conditions and working. In October and November, 1946, he visited Canada and the U.S.A., and he is at present in England; he expects to return to Tanganyika next month. The Tanganyika Railways & Ports Services now operate extensive road motor services for passengers and goods, running 4,000,000 vehicle-miles a year. As Chief Mechanical Engineer, Mr. Bulman has responsibility for the mechanical maintenance and operation of the vehicles. The passenger and goods bodies are constructed completely in the Dar-es-Salaam workshops.

Sir Frederick Bain, Deputy-President of the Federation of British Industries, has been nominated President. This nomination will come before the annual general meeting of the Federation in April, when Sir Clive Baillieu will retire from the

at Whitgift Middle School, Croydon, and joined the L.B.S.C.R. in 1908 as a junior clerk in the Storekeeper's Office at New Cross. He volunteered for military service in August, 1914, and joined the London Rifle Brigade, serving with that regiment until April, 1919. He was wounded at Ypres in 1917, subsequently received a commission, and was awarded the M.C. Mr. Terry took over the Contracts Section of the Storekeeper's Department on his return from military service, and at the amalgamation in 1923 was appointed to the Purchasing Section of the Southern Railway at Waterloo. Later in the same year he was transferred to the Sales Section, of which he took charge in 1938. He was appointed Chief of the Purchasing Section in 1940, and in August, 1945, became Indoor Assistant to the Stores Superintendent.

Mr. C. G. Derbyshire, B.Sc.(Eng.), M.I.R.S.E., Assistant (Development & New Works), Signal & Telegraph Engineer's Department, Watford H.Q., L.M.S.R., who, as recorded in our issue of October 4 last, has been appointed Signalling Assistant to Signal & Telegraph Engineer, Watford H.Q., joined the Chief Civil Engineer's Signal Department, Great Eastern Railway, as an apprentice in 1918. In 1922 he was appointed Junior Assistant, Signal Engineer's Department, and in

Mr. W. Hupkes, President of the Netherlands Railways Company, has retired from that position, and has been appointed a Director. He has been succeeded as President by Mr. F. Q. den Hollander.

We regret to record the death on January 12, at the age of 69, of Sir George Collingwood Clements Hamilton, Bt., Chairman of the White Pass & Yukon Railway Co. Ltd.

We regret to record the death on January 4 of Mr. Bertram Frederick Higman, sometime Chief Commercial Manager, East Indian Railway.

The following commissions and promotions have been gazetted recently, under the heading of Territorial Army—Royal Engineers: Engineer & Railway Staff Corps:—Joseph Rawlinson, M.I.C.E., M.I.Mech.E., to be Major, December 11, 1946; Major T. F. Cameron (late R.E.) to be Lt.-Colonel, December 28, 1946, with seniority, July 2, 1946; Lt.-Colonel L. Leighton, M.I.C.E., M.I.Mech.E., A.M.I.E.E., to be Colonel, December 18, 1946; Major W. P. Shepherd-Barron, M.C., T.D., M.I.C.E., M.I.Mech.E. (late R.E.), to be Lt.-Colonel, December 18, 1946; A. C. Hartley, C.B.E., B.Sc., M.I.C.E., M.I.Mech.E., to be Major, December 21, 1946.

## Ministry of Transport : Accident Report

Hatfield, L.N.E.R. : July 15, 1946

Lt.-Colonel G. R. S. Wilson inquired into the derailment which occurred at about 7.30 p.m. on July 15, 1946, about  $\frac{1}{2}$  mile short of Hatfield, L.N.E.R. The 7.5 p.m. express, Kings Cross to Aberdeen, comprising 14 bogie vehicles, hauled by 2-6-2 "V2" class engine No. 3645, was travelling on the down main at about 60 m.p.h., when all wheels, except the leading pony of the engine and rear bogie of the last vehicle, an L.M.S.R. van, left the rails. This van was screw-coupled to the vehicle in front, and the engine was attached by the tender screw coupling; otherwise the train was Buckeye-coupled throughout.

All couplings held for some 300 yd. beyond the first mark of derailment, when the tender shackle became detached, causing the train to lose the restraining effect of the partly derailed engine. The leading coach broke away to the left and was wrecked, its underframe being thrown upside down on the embankment. The following two coaches were violently overturned, and the next partly, and penetrated by a torn-up rail. The positions of the engine and vehicles after coming to rest are shown, together with other facts relating to the accident, on the diagram on page 82, reproduced from the report.

Out of nearly 400 passengers, only 11 were injured and detained in hospital. Assistance was speedily forthcoming. All four roads were blocked, and there was considerable damage to permanent way, but they were again open for traffic at 7.35 p.m. the next day, a most creditable achievement, especially as there was heavy rain throughout the night. The day and previous day had been cool, with a little rain, following a week of warm, dry weather.

As part of the normal renewal programme, the down main had been re-sleepered and rechaired on June 30 from 1,126 yd. in rear to 174 yd. ahead of the point of derailment, using again the 100-lb. R.B.S. rails, a little worn, with only slight side cutting. All sleepers had been chaired in the depot and the curve was relaid to the existing monuments between up and down main, to a cant of  $2\frac{1}{2}$  in., the company's standard for 80 m.p.h., allowing a deficiency of  $2\frac{1}{2}$  in. below the theoretical 5 in. on a 76-ch. radius. The old ballast, riddled in dry weather, had been used again, and was not open to any real criticism. Colonel Wilson saw no signs of wet formation. The gauge of the down main was found by him to be accurate, or very nearly so, for 600 yd. in rear of the point of derailment.

The curve appeared regular to the eye, and the track generally in good order. Actual cant measurements taken on July 17 at 45 ft. intervals are shown on the drawing, Fig. 2, with dotted line indicating the 2.75-in. cant to which the curve had been packed and levelled finally on July 3. The high rail had gone down appreciably under traffic, general reduction of cant becoming more marked as the point of derailment was approached, as the following averages show:—

### AVERAGE CANT, JULY 17, 1946

Pegs 50 to 40 (150 yd.)	2.50 in.
Pegs 40 to 30 (150 yd.)	2.47 in.
Pegs 30 to 20 (150 yd.)	2.13 in.
Peg 20 to point of initial derailment (123 yd.)	2.07 in.

Colonel Wilson directs attention to the local variations in Fig. 2, particularly be-

tween pegs 30 and 20 (maximum 0.45 in. in 45 ft.); also the low point of the high rail, 2.25 in.-1.75 in.-2.25 in., at site of derailment. The latter was the maximum variation in the length examined, namely, 0.50 in. in 45 ft., representing a cant gradient of 1 in 1080.

### The Locomotive

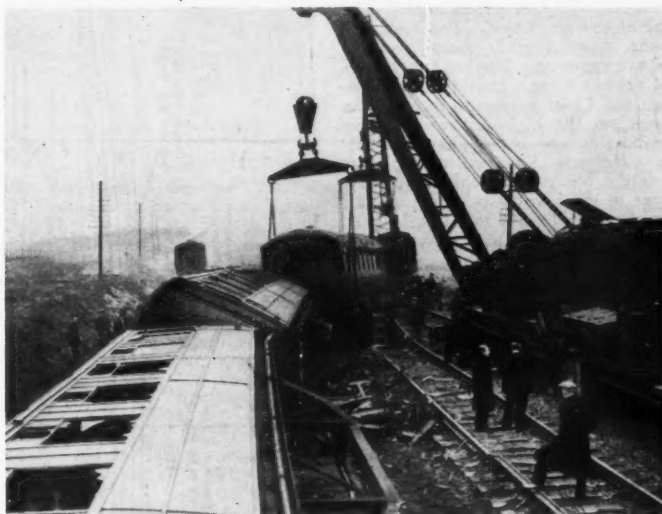
Engine No. 3645 was stabled at Doncaster. It is a heavy, powerful 3-cylinder mixed traffic machine with 6-ft. 2-in. coupled wheels, weighing in working order, with tender, 145 tons 2 cwt. The class—184 in all—has proved a useful general service design and free running up to 75 m.p.h., but its place is being taken in new construction by a 4-6-2 design, also with 6-ft. 2-in. drivers. Built in 1942, the engine had run 184,591 miles, and 30,177 since the last general repair in January, 1946. These engines usually run about 70,000 miles between such repairs.

The middle driving wheels have thin flanges. Centre of gravity is shown in the figure. The leading pony truck frame is

some scoring on the running edge, and for 65 yd. by sinuous distortion without material widening of gauge. Onwards keys were crushed, and chairs marked on the outside, or broken, with inside marking on the high chairs. Evidence of a "carried" wheel or wheels continued for 64 yd. beyond the end of the flange mark, where a low rail was released by fishbolt fracture, after which the down main was completely broken up for 235 yd. This damage (indicated in Fig. 1, 4, and 5) and other details, combined with the destruction of the down slow for 192 yd. and severe damage to the up main for a corresponding distance, led Colonel Wilson to think that the leading vehicles were thrashing from side to side under the haphazard movement of their bogies, under some restraint by the engine, which became detached when the tender shackle left the drawhook of the leading coach.

### The Course of Events

There was reliable evidence that the speed was 58 m.p.h. immediately before the derailment. The driver said the engine was in very good condition and ran steadily until just after passing the cottage shown on the plan (Fig. 1), when there



Clearing the track after the Hatfield accident

pivoted in rear of the main frames at a radius of 6 ft.  $6\frac{1}{2}$  in., with side control by 8 swing links, with no frictional damping, keeping the engine parallel transversely with the pony axle at all stages of side displacement. Side force is zero at zero displacement, and with 11 tons on the axle rises to 4 tons at maximum displacement of  $4\frac{1}{2}$  in. In practice, the weight is increased materially at the expense of that on the coupled wheels, as the front of the engine is lifted by the swing links and restoring force proportionately increased.

The rear radial carrying axle has lubricated bronze Cartazzi slides, inclined at 1 in 10.66. With 16 $\frac{1}{2}$  tons on the axle, the actual restoring force is constant at 1.55 tons, but in practice is slightly increased as more load comes on. The tender drawbar has a coil spring keeping it against the engine with a pressure of 12 tons. Side safety links are not normally in tension. There are no side buffers.

The first sign of derailment was a single light flange mark crossing the right-hand rail in approximately 24 ft., preceded by

was a heavy roll or lurch to the left, much more violent than the slight rolling usual there with a fast train. He felt no return roll and "a few seconds" afterwards violent vibration showed the engine to be derailed.

Making a full brake application, he did not look back until the speed had been reduced appreciably, when the engine had parted from the train and the coaches were "going all over the place." He was certain the engine became derailed before the tender, and the tender before the coaches. He had no impression that the engine had encountered an obstruction, and could not say which of the engine wheels were derailed first.

The fireman thought the violent lurch took place before the cottage was reached. It was the worst he had ever known, and he thought the engine was going right over. The signalman at Red Hall box, 1,100 yd. in rear, noticed nothing unusual.

Two boys, sitting at the top of the cutting about 70 yd. beyond the initial point, observed the whole sequence of the derail-

ment. They noticed marked and unusual movement between engine and tender, and then the front of the leading coach and rear of the tender seemed to jump into the air. One thought the engine wheels, the other, the tender wheels, came off first.

The District Engineer and Chief Permanent Way Inspector said the sleepers and chairs were renewed on June 30, the old rails being re-used, the track being levelled that day to fit it for 20 m.p.h., but not re-ballasted. Final adjustment of line and level was completed by July 3, although all ballast was not replaced until July 6. The speed restriction was kept in force until July 11 (a Thursday) owing to the warm weather, which continued until the end of the week. There was no track distortion. Temperature dropped considerably on the Saturday. It was cool on Sunday, and on the Monday evening, when the derailment occurred, temperature was about 60° F.

#### State of Track

On July 11, the Chief Inspector had examined the track and was satisfied with the alignment and cant, and at 4 p.m. the speed limit was raised to the general overall 60 m.p.h. He considered that the diminution of cant measured on July 17 had been caused by weight of traffic, since removal of the restriction. The high rail had gone down slightly more than he would have expected. The local variations of cant neither witness considered serious, although the Chief Inspector thought the low point on the high rail would have been noticeable and should have had attention. He was, however, certain that the variation was not present on July 11.

Neither of these witnesses could account for the derailment, and the District Engineer thought that the track distortion in rear of the first mark was caused by the irregular movement of the train as vehicles ahead were derailed.

A Permanent Way Inspector was entirely satisfied with the general condition of the road on the evening of July 14; it looked "a beautiful piece of road." He did not check the cant or see any train pass. He thought the variations were due to some sleepers being more heavily packed than others. Shovel packing was the general practice in the district, although discretion was allowed to pack with beaters, if preferred. The rail creep, which had been noticed by Colonel Wilson, was thought to be due possibly to the warm weather in the previous week, but there was a small expansion gap at every joint on July 14.

A sub-ganger found nothing unusual when examining on the morning of the accident. He took particular care to examine by eye line the level of the down main, and had remarked what a good piece of road it was. He had not needed to do any work on it since relaying gangs left it on July 11. "It was left perfect" and he had "had no need to touch it."

The driver concerned found running quite normal the evening before, traversing the curve at 50 to 60 m.p.h. with a Pacific type engine, and other drivers—one of whom passed 12 min. before the derailment—gave similar evidence.

#### Examination of the Engine

Inspection of the engine at Peterborough on July 14 had revealed nothing amiss which could have affected running. Colonel Wilson examined it after it was stripped at Doncaster, and found such material damage as there was to be attributable to the derailment. The wear in the pony swing links did not affect the

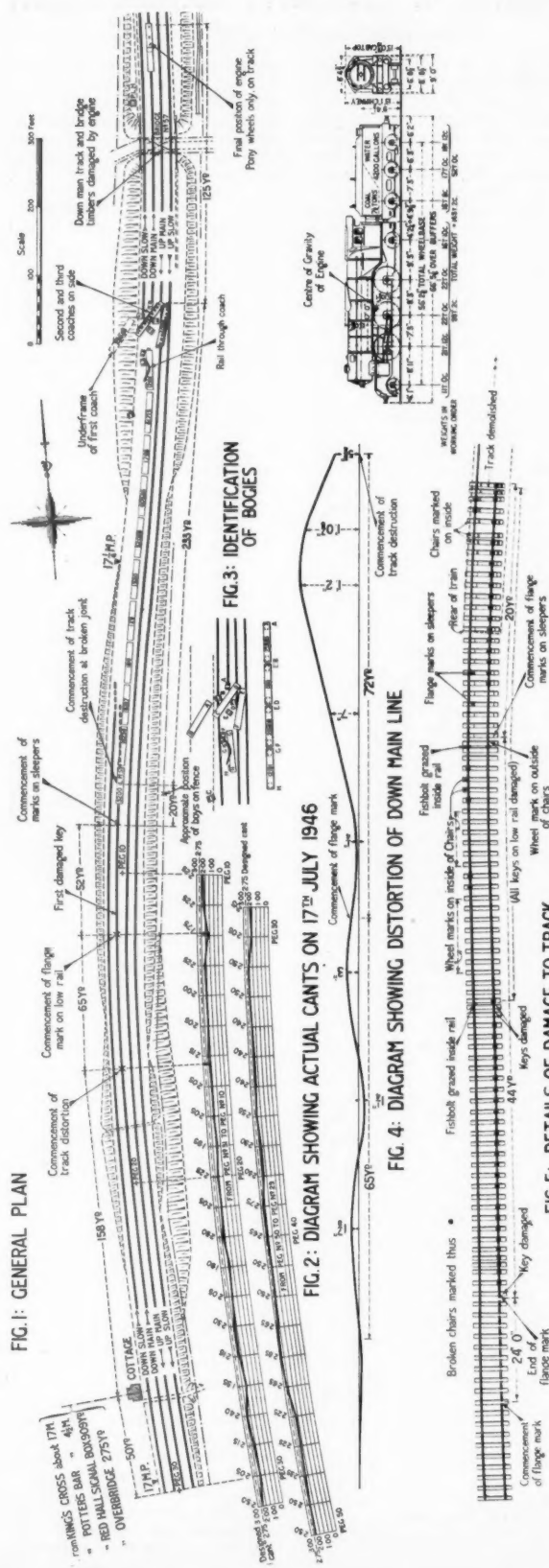


Diagram showing circumstances of derailment near Hatfield, L.N.E.R.



side control action, and the Cartazzi slide surfaces were in good condition and well lubricated. The greatest increase in side play due to wear was found in them and amounted to  $\frac{1}{4}$  in. Two of the four coil springs of the pony axle were found broken, one on each side; the fractures were of long standing and the springs had closed. Such fractures are not unusual. The remaining springs, on engine and tender, were in good order.

Engine and tender were weighed before stripping with the results shown in the table.

There was appreciably less weight than standard on the coupled axles, and more

second was attributed to excessive speed on practically unballasted track, with possibly contributory brake action.

#### Inspecting Officer's Conclusions

Although it was suggested at first that the derailment was initiated by one of the leading carriage bogies, the combined evidence available was held to point to the leading coupled wheels as being the first to leave the rails. They were kept close to the track alignment until breakage of fishplate bolts released a joint of the low rail, after which events became fortuitous as the track was demolished.

The sudden check to the engine as it

a similar effect, though no satisfactory explanation was forthcoming then.

There can be no suggestion that slackness of gauge contributed to lateral oscillation. Though the new track appeared to be in good order, cross levels were found to be not so satisfactory. It seemed possible that the engine rolling, combined with some nosing movement, may have been initiated by variations of cant, leading to distortion before the new track had become fully consolidated. The low point in the high rail immediately before the flange mark may have accounted for the severe culminating roll, and, while the underlying formation was solid, imperfect packing, which must have accounted for the low places, and general diminution of cant, had allowed the high rail to go down still further under load. Apart from the attention which should have been given to the obvious low places, the possible effect of such imperfections under load requires to be borne in mind; otherwise the appearance of new track, with good finish and alignment, may give a false impression of security.

#### Remarks and Recommendation

Deraillments of this character on straight and curved plain line have occurred from time to time, and notable instances were furnished by a series of 11 deraillments in India, and many more cases of track distortion, in which Pacific type locomotives of the "X" class were concerned. These deraillments formed the subject of the Pacific Locomotive Committee's investigation in 1938, whose report dealt exhaustively with the disturbing forces on a locomotive. The general conclusion was that the side controlling force exerted by the bogie was insufficient, particularly in the initial stages of side displacement, and this, under Indian track conditions, led to a marked tendency to rolling and nosing movement (hunting) at a moderate and high speed. Modification of bogie design to provide strong initial spring control was recommended.

The few deraillments, however, in which the "V2" class has been concerned, must be viewed in relation to the aggregate mileage of nearly 50 millions which has been achieved by the 184 engines of the class since its introduction 10 years ago; they have formed the mainstay of secondary express services on main lines. It would be unreasonable to suggest that their employment on express passenger trains on British track represents an unjustifiable risk.

Nevertheless, the tendency to derailment appears to be present on the rare occasions when the various adverse circumstances act in combination, though as a general rule it is continually masked by the solidity and excellent maintenance of the permanent way. No more are being built, but it is recommended that consideration be given to improvement of the front-end side control, possibly after comparative investigation of the flange forces developed at the leading coupled wheels, by the scientific methods now available.

"PARTY OUTINGS" OFFICE AT CHARING CROSS.—The Southern Railway has opened a special office at Charing Cross Station for dealing with "Party Outings," where organisers may call and obtain full information concerning travel facilities. The hours of opening are: Mondays to Fridays, from 8.30 a.m. to 7 p.m.; Saturdays, from 8.30 a.m. to 2 p.m.

LOCOMOTIVE WEIGHTS AS DESIGNED AND AS MEASURED AFTER DERAILMENT

	Designed weights			Actual weights after derailment		
	R.H. Tons cwt.	L.H. Tons cwt.	Total Tons cwt.	R.H. Tons cwt.	L.H. Tons cwt.	Total Tons cwt.
Engine—						
Pony ... ..	5 10	5 10	11 0	6 10	6 1	12 11
Leading ... ..	10 16	10 16	21 12	10 1	10 19	21 0
Driving ... ..	11 0	11 0	22 0	10 4	9 17	20 1
Trailing ... ..	11 0	11 0	22 0	10 6	9 14	20 0
Cartazzi ... ..	8 5	8 5	16 10	9 1	10 9	19 10
Total ... ..	46 11	46 11	93 2	46 2	47 0	93 2
Tender—						
Leading ... ..	8 4	8 4	16 8	6 17	10 17	17 14
Intermediate ... ..	8 10	8 10	17 0	6 17	5 19	12 16
Trailing ... ..	9 6	9 6	18 12	10 12	8 12	19 4
Total ... ..	26 0	26 0	52 0	24 6	25 8	49 14
Water in gauge glass ... ..		4 in.			3 in.	
Coal in firebox ... ..		6 cwt.			Nil	
Water in tank ... ..		(Full) 18 tons 15 cwt.			(Full) 18 tons 15 cwt.	
Coal in bunker ... ..		7 tons 10 cwt.			7 tons 6 cwt.	

on the carrying axles; with 1 ton 11 cwt. excess weight on the pony axle, which was not derailed, despite the broken coil springs.

Irregularity in the tender weights probably was accounted for by straining of its main frames and axlebox damage. Generally, the engine appeared to be in normal condition, and side play was nowhere excessive. Routine examination of the coaches before running empty to Kings Cross revealed no defects, and nothing to account for the accident was found when the bogies of the four leading vehicles eventually were inspected at Doncaster.

The "V2" class engines were not considered to have any special reputation for causing unfair lateral stress to the track, and all the drivers interviewed by Colonel Wilson concurred in saying there was no great difference in the riding of the "V2" and Pacific classes; the "V2s" were, however, more inclined to sideways nosing movement, and the Pacifics to rolling.

Travelling on a "V2" to Grantham, and returning from Doncaster on an "A.1" Pacific, Colonel Wilson found both to run with remarkable steadiness on straight and curved alignment at speeds up to 70 m.p.h., where the track was in first class order, but gained an impression that the "V2" class was rather more sensitive to local track irregularities at a few points. There was, for example, considerable and continuous rolling and nosing at 45 to 50 m.p.h. between Hornsey and Wood Green, and the riding there could not be described as good.

Careful search of the track at the scene of the derailment failed to find any obstruction to account for it. Colonel Wilson considered two other cases of deraillments of "V2" engines, at Newark, on March 13, 1944, and at Thirsk, on February 24, 1946. The first was thought to have been caused by an obstruction; the

became completely derailed, probably caused violent disturbance at the front of the train. It is unlikely that the broken pony axle coil springs had any bearing on events, but the circumstances, considered in conjunction with the Newark and Thirsk cases, appeared to suggest that the "V2" engines might be more than ordinarily sensitive to any weakness in lateral stability of track or cross level imperfections. Centring force of the swing link pony axle is small in initial stages of side displacement, with little or no damping friction, and an undue proportion of the guiding force may be developed at the leading coupled wheels. These are unfavourably placed to exercise the necessary leverage on a long frame with its rear under light side control from Cartazzi slides.

If the track is weak laterally, such high flange pressure may result in distortion, leading directly to derailment, even on straight track; imperfections in cross level regularity, when all the circumstances combine exceptionally to building up rather than damping out of severe rolling, may lead to momentary relief of weight on one side. In that case, the leading coupled flange on that side, if exercising high lateral pressure, would tend to mount the rail.

This, in Colonel Wilson's opinion, probably was the underlying cause of the derailment, where the outward heavy roll brought relief of weight on the inside leading coupled wheel. He was not altogether convinced that track distortion 65 yd. in rear of the first mark was due to irregular movement at the front of the train after derailment of the engine. It seemed possible that combined rolling and side-to-side nosing of the engine may have been responsible. He therefore concluded that interaction between locomotive and track at comparatively high speed, probably was the cause of this accident, and that the Newark derailment may have been due to

## Southern Railway Staff Training College

*Fortnightly and monthly courses for resident students*



On January 10, Colonel Eric Gore Browne, Chairman of the Southern Railway, accompanied by Sir Eustace Missenden, General Manager, Mr. J. B. Elliot, Deputy General Manager, and a number of the chief officers, formally opened the Southern Railway's Staff Training College at Gorse Hill, near Woking.

The College is housed in a three-storey country mansion built in 1910 and adapted to its new use. On the ground floor there are: a lecture room, a spacious reading room, a large dining room, and a students' common room. Students' sleeping accommodation is located on the first floor, and the second floor is used for domestic staff quarters. The grounds and gardens extend over 5½ acres. Ample provision has been made both for outdoor and indoor recreation.

Accommodation is provided for 20

Railway Training School, then situated at East Croydon. The Bursar of the College is Mr. J. M. Leighton-Bailey, B.Sc., previously Outdoor Assistant to the Superintendent of Operation. Specialist instructors are being selected by the Management Committee on the advice of the company's chief officers. Courses are being arranged to cover:—

Traffic Control,  
Advanced Commercial,  
Continental Traffic,  
Office Administration (Technical Depts.)

Advanced Operation.  
Station Supervision.  
Docks and Marine, Labour Relations, Elementary Principles of Railway Work.

The courses will include visits to various stations, yards, offices, etc., on the

Colonel Gore Browne, in addressing the first complement of students at the opening ceremony, said that this was yet another instance of the interest of the Board and the General Manager in the welfare of the staff. He hoped ambitious young men would avail themselves of the facilities afforded by the Staff College. In his opinion, the Government's plans for the future of transport need not dismay the keen young railwayman. Regarding the Staff College, he thought it only fair to point out that the selection of a candidate for a course carried with it no guarantee of subsequent promotion. He wanted to offer a word of encouragement, hope, and confidence to all students. Whatever their political views, they must remember that, first and foremost, they were railwaymen. Whatever the future organisation of transport under the Government plans, there would be even wider scope for the young men of the Southern Railway, and they should never lose their pride in its traditions.

Sir Eustace Missenden, in welcoming the students, said he had a special interest in the fact that the subject selected for the first course was "Traffic Control," as in his early days on the South Eastern & Chatham Railway, he, in conjunction with their Traffic Manager, Mr. R. M. T. Richards, inaugurated a simple form of traffic control for returning hop-pickers.

He hoped that students would have a happy and fruitful experience, and that, when they returned to duty, they would set the tone of the college and encourage their friends to compete for the distinction. Selection was not necessarily an assurance of future success. Students were selected because they had shown promise; if they did well at the college, the fact would be recorded, and, in any case, the knowledge they acquired would stand them in good stead in the years to come. The future held valuable prizes, and it was for them to make full use of their opportunities.

Southern Railway officers present, in addition to those mentioned, included:—Brig. L. F. S. Dawes, Secretary, V. A. M. Robertson, Chief Civil Engineer, W. J. Sawkins, Chief Accountant, O. W. Cromwell, Chief Officer for Labour & Establishment, R. M. T. Richards, Traffic Manager, Frank Gilbert, Deputy Chief Officer for Labour & Establishment, A. B. MacLeod, Stores Superintendent, Lt.-Colonel H. C. Prescott, Chief of Police, A. Endicott, Estate & Rating Surveyor, C. Grasemann, Public Relations & Advertising Officer, J. L. Harrington, Assistant to General Manager, A. E. Hammett, Commercial Superintendent, S. W. Smart, Superintendent of Operation.

## Staggered Hours in Central London

The first of a series of meetings to inaugurate the collection of information by which pressure on transport services in London at the peak hours may be reduced, was held in Westminster on January 7. The meeting was attended by nearly 100 representatives of Government departments, business undertakings, trade unions, trade associations, and chambers of commerce in the Westminster area. This was the first of 14 meetings to be held in the various zones into which the Central London area has been divided.

Mr. G. R. Strauss, Parliamentary Secretary to the Ministry of Transport, said the meeting had been convened by the Ministry to consider and initiate action for getting rid of rush-hour congestion.

There had been a very considerable worsening in the rush-hour problem dur-



*Mr. Payne handing the key of the college to Colonel Gore Browne*

students. Courses consist of either two or four weeks' duration, and it is anticipated that between 250 and 400 students will pass through the college each year. Students are selected on the recommendation of their departmental officers. The Principal of the College is Mr. A. C. J. Payne, who, while on active service in the recent war, was in 1942 promoted Assistant Divisional Superintendent, London East Division. He was previously an instructor in Signalling, Rules & Regulations at the Southern

company's system. At the conclusion of a course, a report will be made by the Principal on each student's work, and sent to his departmental office.

### OPENING CEREMONY

Mr. J. B. Elliot, as Chairman of the Management Committee, welcomed Colonel Eric Gore Browne and thanked all concerned for their efforts in obtaining furnishing and equipment, which had expedited the opening of the college.

ing the last year or so for two reasons, one of which was the shortening of hours of work, so that more people wished to travel at the same time than ever before, and the other was the shortage of buses. But, however many buses were on the roads, it would still be impossible to deal adequately with the present rush hours.

Experience had shown that these difficulties could be overcome provided there was sufficient willingness to co-operate among those concerned. Definite evidence had been gained during the war years of the immense benefits that arose from the staggering of hours. He asked the meeting to take this matter very seriously as a most urgent problem, but one that, with their co-operation, could be overcome. Mr. Strauss then called upon Mr. G. F. Sinclair, Deputy General Manager (Road Services), London Transport, to put forward the board's proposals.

Mr. G. F. Sinclair said that a part of the problem confronting the main-line railways and the London Passenger Transport Board today was the carriage of

450,000 people into the West End of London between 7 a.m. and 10 a.m., half of whom were concentrated within one hour between 8.30 a.m. and 9.30 a.m.; and a similar traffic movement in the opposite direction between 4.30 p.m. and 7 p.m., during which 300,000 people were carried between 5 p.m. and 6 p.m. Despite attempts to ease the flow of traffic, congestion was increasing by reason of the return of offices and other establishments to Westminster. The board was compelled to appeal for a reduction in the maximum peak-hour traffic demands for transport by at least 20 per cent. in all districts within the central area.

The suggestion was that local transport groups should be formed in the 14 Central London zones, and all employers having 100 or more staff would be asked to inform the board through their local transport group of their hours of work. This information would be summarised to show the total movement arising in quarter-hour periods during morning and evening peak hours. With this information, it

would be possible to discuss with the groups, and with individual firms, the manner in which it might be possible to secure adjustments which would give reduced demands for transport during the peak hours.

Answering questions at the close of the meeting, Mr. Strauss pointed out that, although in some cases people might leave work 15 minutes later, they would, in fact, reach home 15 minutes earlier because of the improved flow of traffic under the staggering scheme. He proposed that the meeting should form a local transport group and appoint a group leader, whose business it would be to prepare a questionnaire on working hours, and to get the scheme going. A committee of five members was elected for this purpose.

In connection with this campaign, London Transport has issued an illustrated booklet, "The Problem of the Peaks," in which the staggered-hour proposals are explained, and suggestions are given for the manner in which the local transport groups should conduct their work.

## The Transport Bill

Road-rail co-ordination discussed in letters to "The Times"

The following is a further selection of correspondence on the Transport Bill which has appeared in recent issues of *The Times*:—

### CO-ORDINATION DIFFERENCES

Recent correspondence in your columns on the Transport Bill has failed to bring out one of the main differences between road-rail co-ordination as understood by the railways and large haulers and by the nationalists. A main difference of approach is that, whereas the objective of the Transport Bill is to achieve unification by organising the whole of transport as a single undertaking, the railways and road haulers scheme is mainly based on the elimination of competition through agreed statutory rates. Each section would continue under independent ownership, and its operation, functionally and financially, would remain unaltered. Under the Transport Bill, on the other hand, the Commission is the co-ordinating body, and the operating executives are subordinate to it. In Clause 3 can be found the key to the Government scheme of unification. The alternative proposal of the road-rail interests would lead to a private monopoly, as Mr. Douglas Jay rightly argues, but to his argument I would add another. Once statutory rates are enforceable, the small man can no longer compete with the large operator by undercutting him. Once statutory rates are fixed, he is at a disadvantage: the small-sized operations make it far more difficult to offer the same service as the larger operators, and he is less favourably placed as to obtaining return loads, etc. Combined with the licensing system, which restricts the number of vehicles operating, it would then pay the larger to absorb the smaller operator. The small man would have been more completely eliminated than he will be under the Government scheme, which enables him to operate within a certain radius, and farther afield under a special permit.

Elimination of competition does not achieve that co-ordination of all transport forms necessary to ensure their most efficient and economic combined use. The railways have failed to adjust their methods of operation to road motor traction. The present system of goods collection at local stations, and the system of feeder trains, marshalling yards, etc., involves a great

deal of unnecessary shunting which wastes labour and engine power. For instance, the 1938 official figures show that the net ton-miles haul, including shunting, was less than half what it could have been if shunting were eliminated. It could be about doubled if the proper use were made of motor vehicles to collect and deliver the goods to railheads instead of to wayside stations. Because of the separate ownership of road and rail transport, this long overdue reorganisation has not taken place. Unification of ownership is essential to such co-ordination; agreed charges and the elimination of competition would not achieve this—they are insufficient. Further, the organisation of the road haulage business into innumerable small units, which Mr. Duffield and Sir Charles Newton defend, works against such co-ordination.

Finally, these representatives of the road and rail conference defend their scheme because, *inter alia*, it preserves the freedom of traders' choice, and because it leaves the trader free to carry his own goods. There is nothing in the Government Transport Bill which restricts the freedom of choice of the trader, nothing to prevent his choosing road, rail, or canal as the most suitable transport for his goods. The only restriction is that he cannot transport his own goods in his own vehicles over 40 miles unless he can prove that it is advantageous to his business. So long as there is reasonable interpretation of this qualification, traders are unlikely to find they suffer any inconvenience. On the contrary, the advantages of unification and co-ordination are bound ultimately to accrue to their benefit.

Yours, etc.,

ERNEST DAVIES

House of Commons, January 3

### RESTRICTING PERSONAL SERVICE

Mr. Ernest Davies is less than fair to the recent road-rail proposals when he compares them unfavourably with the Government's plan, on the ground that they merely advocate agreement by way of statutory rates; and proceeds to adumbrate his own ideas on the organisation of inland transport by way of concentration of rail services at railheads with redistribution by motor transport. If he had taken the

trouble to study the recent road-rail proposals he would know that such joint working was as much a main feature as the rates agreements on which he lays such stress.

Mr. Davies's remarks upon the small hauler would appear to be somewhat illogical. After declaring that under the road-rail proposals the small hauler would be eliminated through his inability to cut rates, he further states that "the organisation of the road haulage business into innumerable small units works against . . . co-ordination." His assumption that small haulers can cut rates is typical of the theorist who dabbles in transport matters. A most careful investigation of costs shows no advantage in favour of the small hauler as against the large. Rate-cutting, therefore, can only result in the small hauler's bankruptcy, and in depressing rates below an economic level, both by road and rail. That the proposals contained ample safeguards against monopoly exploitation is proved by the unanimous support of them by trade and industry. On the other hand, at level rates there will always be a place in transport for the small hauler by reason of the personal service which he is able to give his customers. The same can scarcely be said for the small hauler if the Transport Bill becomes law. He will be restricted to 25 miles and will have to meet the competition of the Government monopoly, which not only will have no restriction on its own radius of operation, but will also be the body from which the hauler will have to seek a permit to exceed 25 miles.

The final suggestion of Mr. Davies that the trader would be given freedom by the Government to operate his own vehicles sounds unexceptionable until one remembers the Minister's warning that such freedom must not "sabotage" the National Transport Board. Many interpretations could be put upon the word "sabotage," but one thing is certain, that every ounce of traffic taken from the State monopoly will mean loss of revenue to it, and that every application to carry traffic in vehicles other than those belonging to the monopoly will consequently be frowned upon as undesirable, or, indeed, classed as sabotage.

Yours faithfully,

A. E. SEWELL,

Chairman, Rail Side,

ROGER W. SEWELL,

Chairman, Road Side, Road & Rail Central Conference

January 7



## Notes and News

**L.M.S.R. Annual General Meeting.**—The L.M.S.R. announces that it is proposed to hold the annual general meeting of the company at 11.30 a.m. on Friday, February 28.

**London Midland & Scottish Railway Company.**—A balance of the L.M.S.R. 4 per cent. guaranteed, 4 per cent. preference (1923), and ordinary stocks will be struck at the close of business on January 22.

**Technical Representative Required.**—A technical representative, age not to exceed 40, is required by British Belting & Asbestos Limited, Scandinavia Mills, Cleckheaton, Yorkshire. See Official Notices on page 87.

**Charles Roberts & Co. Ltd.**—The company announces that an interim dividend of 7½ per cent. will be paid on the ordinary stock on account of the year ending March 31, 1947. A similar dividend was paid on this stock in the preceding year.

**Draughtsman Required.**—A draughtsman, under 30 years of age, is required by a firm of manufacturers in the Midlands. Candidates must have practical knowledge of design and details of railway permanent way equipment, mainly switches, crossings, and layouts. See Official Notices on page 87.

**District Locomotive Superintendent Required.**—A district locomotive superintendent, between 25 and 35 years of age, is required by the Sudan Railways for service in the Sudan. Candidates must be fully qualified locomotive engineers, both in theory and practice, should have graduated in mechanical engineering from a university and/or should be chartered engineers. See Official Notices on page 87.

**Cancellation of Special Trains.**—The Minister of Transport announces that owing to the necessity for clearing the railways as much as possible for the movement of urgently needed coal supplies to the power stations and factories, special trains for sporting events or organised parties have been cancelled from Monday, January 13, until further notice. The

need for this step is regretted, and the situation will be kept constantly under review, so that railway facilities for these purposes may be restored as soon as conditions permit.

**Assistant Traffic Manager Required.**—An assistant traffic manager (operating), age between 30 and 40 years, with locomotive running experience, is required by a South Wales steel works. See Official Notices on page 87.

**Public Transport Association.**—The 1947 conference of the Public Transport Association is to be held at Eastbourne on May 6 to 8. The conference headquarters will be at the Grand Hotel. Those wishing to attend the conference should notify the Secretary, Mr. Eric D. Croft, Brettenham House, Lancaster Place, W.C.2, not later than January 31.

**Midland Bank Limited.**—The directors report that the net profit for 1946 was £1,987,148, as compared with £2,056,274 in 1945, and that the addition of £751,998 brought in from the previous year gives a total of £2,739,146. An interim dividend of 8 per cent., less income tax, for the half-year ended June 30, 1946, took £666,979, and appropriations have been made of £230,000 to bank premises account and £400,000 to reserve for future contingencies, leaving £1,442,167, out of which the directors recommend a dividend payable on February 1 of 8 per cent., less tax, for the half-year ended December 31, 1946. The balance to be carried forward is £775,188.

**Reduction in L.M.S.R. Holyhead-Kingstown Sailings.**—The L.M.S.R. announces that in order to effect economy in coal consumption, the Holyhead to Kingstown steamship service will be reduced to one sailing daily in each direction from January 20 to March 29 inclusive. During that period the sailings will be as follow: 3.45 a.m. depart Holyhead; 8.30 p.m. depart Kingstown. As a result of this reduction, the following passenger trains also will be temporarily suspended: 8.15 a.m. Euston to Holyhead; 1.35 p.m. Holyhead to Euston. In order to maintain the morning service from London to the North

Wales coast stations, however, a new train will be run from Crewe to Bangor at 11.55 a.m., forming part of the existing 12.20 p.m. Chester to Bangor. Passengers from London for North Wales should travel by the 8.30 a.m. Euston to Liverpool, changing at Crewe into the new 11.55 a.m. to Bangor.

**Road Accidents in November, 1946.**—The return issued by the Ministry of Transport of the number of persons reported to have died, or to have been in-

## British and Irish Railway Stocks and Shares

Stocks	Highest 1946	Lowest 1946	Prices	
			Jan. 14, 1947	Rise Fall
G.W.R.				
Cons. Ord. ....	61½	54½	58	—
5% Con. Pref. ....	126½	107	122½	— 1
5% Red. Pref. (1950) ..	106½	102½	104½	—
5% Rt. Charge ....	140½	122½	135½xd	—
5% Cons G.uar. ....	137½	118½	134½	—
4% Deb. ....	129½	106	123½xd	— 2
4½% Deb. ....	129½	107	124½xd	—
4½% Deb. ....	130½	114	126½xd	— 1
5% Deb. ....	142½	125	137½xd	—
2½% Deb. ....	95½	81½	92½xd	—
L.M.S.R.				
Ord. ....	30½	26½	30½	— ½
4% Pref. (1923) ....	64	52½	61½	— 1
4% Pref. ....	86	75½	82½	— 1
5% Red. Pref. (1955) ..	105½	97	102½	—
4% Guar. ....	108½	100	104½	— 1
4% Deb. ....	120	103	113½	— 1½
5% Red. Deb. (1952) ..	108½	105½	105½	—
L.N.E.R.				
5% Pref. Ord. ....	7	5	6½	— ½
Def. Ord. ....	3½	2½	3½	—
4% First Pref. ....	59½	50½	56½	— 1
4% Second Pref. ....	29½	25½	29½	—
5% Red. Pref. (1955) ..	104	97	100½	— 2
4% First Guar. ....	107	98	103½	— 1
4% Second Guar. ....	101	90	97½	— 1
3% Deb. ....	104	87½	99	— 1
4% Deb. ....	119½	102½	113½	— 1
5% Red. Deb. (1947) ..	101	99	99½	—
4½% Sinking Fund Red. Deb. ....	107½	101½	102½	—
SOUTHERN				
Pref. Ord. ....	79½	70	75½	— 1
Def. Ord. ....	24	19½	24	—
5% Pref. ....	125½	107	121½	— 1
5% Red. Pref. (1964) ..	115½	106½	112½	—
5% Guar. Pref. ....	137½	119	134½	—
5% Red. Guar. Pref. (1957) ....	115½	107½	112½	—
4% Deb. ....	129½	105½	123½	— 2
5% Deb. ....	159½	125½	135½	— 1
4% Red. Deb. (1962- 67) ....	113½	104½	109½	—
4% Red. Deb. (1970- 80) ....	115½	104½	111½	—
FORTH BRIDGE				
4% Deb. ....	109	103	104½	—
4% Guar. ....	105	102	101	—
L.P.T.B.				
4½% "A" ....	133½	120½	127½	— 2
5% "A" ....	142½	130½	137½	— 1
3% Guar. (1967-72) ..	108	98	105½	—
5% "B" ....	128½	117½	123½	— 1
5% "C" ....	64½	56½	64½	— 1
MERSEY				
Ord. ....	34	30	34	—
3% Perp. Pref. ....	76	69	73½	—
4% Perp. Deb. ....	117½	103	112	—
3% Perp. Deb. ....	98	81	93½	—
IRELAND*				
BELFAST & C.D.				
Ord. ....	8½	6	7½	—
G. NORTHERN				
Ord. ....	41½	31½	39	—
Pref. ....	63½	52	62½	—
Guar. ....	97½	78½	97	—
Deb. ....	107	97½	105½	—
IRISH TRANSPORT				
Common ....	19½	16½	18½	—
3% Deb. ....	107	100	105½	—

\* Latest available quotation

## G.W.R. Stand at Welsh Industries Fair



Exhibits typifying railway service shown at the G.W.R. stand at the Welsh Industries Fair at the Royal Horticultural Hall, London, from January 1 to 7 last

## OFFICIAL NOTICES

## County Borough of Southend-on-Sea

## NEW ROLLING STOCK—PIER ELECTRIC RAILWAY

TENDERS are invited for the supply of new Electrically-Operated Rolling Stock, composed of 4 Seven-Coach Train-sets complete, suitable for use on Southend Pier Electric Railway, which operates from a 550-V. D.C. Traction Supply.

Copies of the General Conditions, Specification and Form of Tender may be obtained on application to the Piermaster & Foreshore Manager, Pier Hill Buildings, Southend-on-Sea, accompanied by a fee of 2 guineas, which will be refunded on receipt of a bona fide Tender (not subsequently withdrawn) and the return of all documents supplied.

Tenders, which must be enclosed in a plain sealed envelope, not bearing any name or mark indicating the sender, and endorsed "Tender for Rolling Stock: Southend Pier Electric Railway," must be delivered to me before 10 a.m. on March 13, 1947.

The Corporation do not bind themselves to accept the lowest or any Tender.

ARCHIBALD GLEN,  
Town Clerk

Municipal Offices,  
Clarence Road,  
Southend-on-Sea  
January 15, 1947.

THE "PAGET" LOCOMOTIVE. Hitherto unpublished details of Sir Cecil Paget's heroic experiment. Eight steam cylinders with rotary valves. An application of the principles of the Willans central-valve engine to the steam locomotive. By James Clayton, M.B.E., M.I.Mech.E. Reprinted from *The Railway Gazette*, November 2, 1945. Price 2s. Post free 2s. 3d.

REQUIRED by large South Wales Iron and Steel-works, Assistant Traffic Manager (Operating) with Loco. Running experience. Experience of Control Methods an advantage. Age 30-40. State age, experience, salary required, and when available.—Box 53, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

DRAUGHTSMAN, a really good man, under 30, with sound practical knowledge of design and details of Railway Permanent Way equipment, mainly Switches, Crossings, and Layouts. Required by Midlands Manufacturers. Good opportunity for right man. State full details of training and experience, and salary required.—Box No. 51, c/o *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

TECHNICAL REPRESENTATIVE required to call on Railway Interests in the United Kingdom. Age not to exceed 40. Applicants must have good personality and have confidence when meeting high executives. Knowledge of Railway Engineering essential and of languages desirable. Applications giving details of qualifications, experience, and salary required to: PERSONNEL DEPARTMENT, BRITISH BELTING & ASBESTOS LIMITED, Scandinavia Mills, Cleckheaton, Yorkshire.

THE RAILWAY SYSTEM OF JAMAICA. A general description of the system and its traffic, with an account of economic problems; the motive power used; and some features of operation. By H. R. Fox, B.Sc., M.Inst.C.E., General Manager, Jamaica Government Railway. Reprinted from *The Railway Gazette*, January 5 and 12, 1945. Price 1s. Post free 1s. 2d.

## Sudan Government

SUDAN RAILWAYS require a District Locomotive Superintendent for service in the Sudan. Duties include administration of loco. running sheds, maintenance of locomotives and rolling stock, and general mechanical engineering. Candidates must be fully qualified locomotive engineers, both in theory and practice, should have graduated in mechanical engineering from a University and/or should be chartered engineers. They should also have served a full pupilage or apprenticeship on a railway or with locomotive builders, and should have occupied a position of responsibility for not less than one year. Age limits 25-35.

Appointment on two years' probation with a view to permanent pensionable service or to Provident Fund Contract, with a minimum security for seven years, after probation. The salary scale under pension conditions is: £E.480-540-600-660-720-780-852-936, increments being biennial, except the last, which is after three years at £E.852. On Provident Fund terms salaries are about 17½ per cent. higher. (£E.1 = £1 0s. 6d.). Starting rates are according to age, qualification and experience.

Outfit allowance of £E.60 is payable, provided salary does not exceed £E.600 on Probationary Contract and £E.700 on Provident Fund Contract.

Cost-of-living allowance at the rate of 35 per cent. of salary, subject to a maximum of £E.15 payable on all salaries up to £E.1,200 per annum.

At present there is no Income Tax in the Sudan. Strict medical examination. Free passage on appointment.

Application forms are obtainable from the Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1, marking envelopes "District Loco. Superintendent."

jured, as a result of road accidents in Great Britain during the month of November last shows 531 deaths (compared with 481 in November, 1945), 3,357 seriously injured (compared with 3,027 in November, 1945), and 11,139 slightly injured (compared with 9,010).

Liverpool Overhead Traffic.—Receipts of the Liverpool Overhead Railway for the week ended December 29, 1946, were £2,043, a decrease of £5. Aggregate traffic for the 52 weeks to December 29 were £153,406, comparing with £168,020 for the period January 1 to December 30, 1945.

Milan-Rome Electric Service.—Restoration of the overhead conductors on the 24-mile section between Arezzo and San Giovanni Valdarno on December 24, 1946, has permitted the resumption of electric working throughout between Milan and Rome. A new train has been introduced in each direction, running from Milan to Rome in 11 hr. 25 min., and from Rome to Milan in 11 hr. These timings compare with 11 hr. 55 min. by the fast trains running hitherto, which were diesel hauled between Rome and Florence (see our August 23, 1946, issue).

Merger of Diesel Firms.—A merger has been completed between Marshall, Sons & Co. Ltd., of Gainsborough, and John Fowler & Co. Ltd. (Leeds). The firms, both nearly 100 years old, are to pool manufacturing, design, and selling organisations, and will continue to produce diesel engines and locomotives, tractors, threshing machinery, tea preparing machinery, road rollers, and wire drawing machinery. Mr. C. W. Hayward and Captain E. N. Griffith, Chairman and Deputy-Chairman respectively of the Fowler company, will join the board of the Marshall company, and certain Marshall directors will join the Board of John Fowler & Co. Ltd. (Leeds).

L.M.S.R. Contracts.—The L.M.S.R. announce that contracts for engineering work have been placed with the following firms:—

Wellerman Bros. Ltd., Sheffield, for the foundation for a new 60-ft. dia.

turntable situated at Bransty Station, Whitehaven;

L. Fairclough Limited, of Adlington, Lancs., for excavations, etc., at Coleham motive power depot, Shrewsbury, in connection with refuelling facilities for oil-burning locomotives, and in connection with a new 70-ft. dia. turntable;

I. Jackson & Sons Ltd., Lancaster, for repairs to slipway and traverser carriages, Fleetwood Harbour;

Dowsett Engineering Construction Limited, Tallington, near Stamford, Lincs., for provision of venturi meter and gauging station on the Shropshire Union Canal at Llantisilio, North Wales.

Cost-of-Living Index.—At November 30 last, the official cost-of-living index figure was 104 points above the level of July, 1914, compared with 103 points at November 1. At December 1, 1938, the cost-of-living index was 56 points above July, 1914.

Channel Islands Airways Traffic.—During the year from January 1 to December 31, 1946, a total of 74,646 passengers, 883,232 lb. of cargo, and 546,837 lb. of Post Office mail were carried by Channel Islands Airways. Over 1,500,000 miles were flown in 13,000 flying-hours, and 12,861 flights were completed. The company's previous record was in 1938, when 34,962 passengers were carried. From the inauguration of air services to the Channel Islands on December 18, 1933, to December 31, 1946, a total of 272,853 passengers was carried, and but for the suspension of services during the years of occupation, it is quite possible that the 500,000 mark would have been reached, if not exceeded.

L.M.S.R. Living-Trains for London Railway Workers.—To relieve the difficulty of obtaining houses or lodgings for railway workers, the L.M.S.R. is converting a fleet of pre-war caravan camping coaches into living-trains for permanent-way staff. Conversion is in progress at Wolverton Carriage Works, and when completed in a few weeks' time will provide eight living-trains. They will be stabled at sidings in Outer London and the Home Counties. Each will accommodate 20 men, and consist of three coaches: two will be dormi-

tory-coaches, with comfortable beds (not tiered bunks). The third coach will have a self-contained kitchen and two living-rooms. A cook-attendant will "house-keep" for each train.

William Asquith Limited.—The report of the directors of William Asquith Limited for the year ended August 15, 1946, shows a balance of profit available after making provision for taxation, depreciation, and directors' fees, of £20,428, a decrease of £7,930. After payment of a dividend on the 8 per cent. cumulative participating preference shares, and a proposed dividend of 10 per cent. on the ordinary shares, the balance to be carried forward to next year of £12,697 compares with £3,792 brought in. Current assets stand at £423,910, as against £338,844 on August 15, 1945.

B.E.A. and Schoolboys' Own Exhibition.—At the Schoolboys' Own Exhibition in London the British Engineers' Association has a comprehensive information stand, at which a "Chart of Opportunity" is provided, showing the entry age and possible stages of progress for "trade apprentices," "student apprentices," and "graduate apprentices." A large number of engineering manufacturers' training-scheme brochures is available, and a postcard inquiry form enables contact to be made with an engineering works which may most nearly accord with a youth's requirements as to training, location, and nature of course.

## Forthcoming Meetings

January 20 (Mon.).—The Institute of Transport (Metropolitan Graduate & Student Society), at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. 5.30 p.m. "Planning and its Relation to Transport," by Mr. J. H. Custins Payne (Graduate).

January 22 (Wed.).—The Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2. 5 p.m. "Gas Turbines," by Sir Claude Gibb, C.B.E., and Dr. A. T. Bowden, of Messrs. C. A. Parsons & Co. Ltd.

## Railway Stock Market

There has been considerable activity in stock markets despite labour troubles and the fuel situation. After their recent further upward movement, British Funds were inclined to ease, the impression being that the bulk of reinvestment of Local Loans repayment money has been completed. A feature has been a further strong advance in Cable & Wireless stock on expectations that arbitration will result in a compensation for the operating company which will justify a higher level than 150 for the holding company's ordinary stock. There was also selective buying of colliery shares, Staveley, Stanton, Carlton Main and Powell Duffryn all improving.

Iron and steels remained firm, despite the threat of nationalisation "before the next Election," the general belief continuing that the industry can look for a "reprieve" of at least two years. In fact, a number of good features developed, particularly Stewarts and Lloyds, which responded to the big demand for steel pipes indicated by Middle East oil pipeline projects. Beyer Peacock changed hands around 25s. 9d., North British Locomotive up to 29s. 7½d., and Vulcan Foundry at 33s. 6d. Firth Brown rallied further, and the new 4 per cent. preference shares of Firth Brown Tools were 9d. premium over the issue price of 21s.

The compensation clauses of the Electricity Bill have come as a shock to the City. There had been hopes that, in view of the widespread criticism of the Transport Bill, compensation for electricity supply shareholders would not be based on market values of shares, but on net maintainable revenue as decided by an independent tribunal. In fact all the

criticisms of the Transport Bill, including the statement of the Stock Exchange Council as to the unfairness of taking market values as a basis, can be levelled at the Electricity Bill. Shareholders will suffer a substantial fall in income by the transfer into Government Electricity stock, which like Transport stock, is generally expected to carry interest at 2½ per cent. As in the case of the railways, there are restrictions on dividend payments prior to the transfer of the industry to nationalisation.

The Electricity Bill had an adverse influence on the home railway market, because with the electricity proposals being on a similar pattern, it would seem there is little prospect of the Government permitting modification of the railway terms before the Transport Bill passes into law. As was the case after the railway terms, electricity supply shares have lost ground, and are below the "take-over" levels. Investors generally realise the loss of income involved by the proposed compensation and there has been a fair amount of selling with a view to reinvesting into leading industrial shares and other securities offering higher yields than Government stocks. On the other hand, like railway stocks, electricity supply securities have come into institutional demand on the ground that, taking more than a short view, current market prices can be regarded as representing a means of acquiring a Government stock at a discount.

Home railway junior stocks failed to attract much buying interest despite the forthcoming dividends, and prices again eased, Great Western being 57½, against 58 a week ago; Southern preferred receded from 76½ to 76 and the deferred from 24

to 23½. L.N.E.R. second preference was 29½, compared with 29½ a week ago, and the first preference eased from 57½ to 56½. L.M.S.R. preferences also lost ground, the senior preference being 82½, against 83½, and the 1923 preference 61½, against 62½. The "take-over" price for the senior preference is 85½. Where changed, debenture stocks have also shown fractional declines, and are at levels which appear to have definite attractions, assuming the proposed British Transport stock carries interest at 2½ per cent. and is issued at par.

It can hardly be contended that sentiment in regard to home railway stocks has been affected by the further decrease shown by the latest traffic returns, because home railway stocks are dominated by the nationalisation compensation terms. It is clear that for the first year since its inception, the fixed rental agreement will show a deficit for the Government; but the agreement yielded a big profit to the Government during the period of the war, because stockholders were allowed to benefit only to a very moderate extent.

Argentine rails have eased in the continued absence of definite news as to the progress of the Buenos Aires talks. Buenos Ayres Great Southern receded from 13 to 12½ and the 4 per cent. debentures from 86½ to 86½; Central Argentine 4 per cent. debentures at 79 and Buenos Ayres & Pacific 4 per cent. debentures at 86 were also fractionally lower. Elsewhere, Antofagasta preference further improved to 57, and French railway sterling bonds were moderately higher. Profit-taking, however, brought San Paulo back from 139 to 136. Manila Railway preference attracted some attention up to 7s. 6d.

### Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffic for week		No. of Week	Aggregate traffic to date			Shares or Stock	Prices		
				Total this year	Inc. or dec. compared with 1944/5		Totals		Increase or decrease		Highest 1945	Lowest 1945	January 14, 1947
							1946/7	1945/6					
South & Central America				£	£		£	£	£				
				ps.	—		ps.	ps.	+	Ord. Stk.			
	Antofagasta ...	834	5.1.47	31,170	+ 1,530	1	31,170	29,640	+ 1,530	Ord. Stk.	12	8½	10
	Arg. N.E. ...	753	4.1.47	ps.293,500	— ps.20,300	27	ps.8,502,500	ps.8,155,300	+ ps.347,200	"	10	5½	16½
	Bolivar ...	174	Dec., 1946	4,279	— 863	52	51,910	58,425	— 6,515	6 p.c. Deb.	8½	5½	6½
	Brazil ...	—	—	—	—	—	—	—	—	Bonds	25	17	26½
	B.A. Pacific ...	2,771	4.1.47	ps.1,962,000	— ps.610,000	27	ps.60,156,000	ps.57,715,000	+ ps.2,441,000	Ord. Stk.	7	5	7½
	B.A.G.S. ...	5,080	4.1.47	ps.3,536,000	+ ps.127,000	27	ps.90,546,000	ps.86,802,000	+ ps.3,744,000	Ord. Stk.	13½	10½	12½
	B.A. Western ...	1,924	4.1.47	ps.1,250,000	— ps.132,200	27	ps.33,521,000	ps.31,923,000	+ ps.1,598,000	"	12½	9½	16
	Cent. Argentine	3,700	4.1.47	ps.3,311,360	+ ps.13,760	27	ps.85,151,757	ps.82,428,550	+ ps.2,723,207	"	24	7	9
	Do.	—	—	—	—	—	—	—	—	Did.	5	2½	5
	Cent. Uruguay ...	970	4.1.47	34,055	— 7,452	27	983,273	1,020,463	— 37,190	Ord. Stk.	7½	4	9
	Costa Rica ...	262	Aug., 1946	36,220	+ 4,160	9	73,313	63,153	+ 10,160	Ord. Stk.	16½	13	9
	Dorada ...	70	Nov., 1946	27,600	— 1,354	48	337,575	330,489	+ 7,086	1 Mt. Deb.	103	102	100½
	Entre Rios ...	808	4.1.47	ps.427,400	— ps.58,200	27	ps.11,534,000	ps.11,422,200	+ ps.111,800	Ord. Stk.	7½	4½	6½
	G.W. of Brazil	1,030	4.1.47	18,600	— 1,800	1	18,600	20,400	— 1,800	Ord. Stk.	30½	23½	20½
	Inter. Ctl. Amer.	794	Nov., 1946	\$833,362	+ \$197,150	48	\$9,543,915	\$8,130,214	+ \$1,413,701	5 p.c. Deb.	78	70	65
	La Guaira ...	22½	Dec., 1946	4,705	— 650	52	67,508	74,152	— 6,644	Ord. Stk.	4½	3½	3½
	Leopoldina ...	1,918	4.1.47	73,710	+ 15,481	1	36,716	30,765	+ 5,951	Ord. Stk.	4½	4	4
	Mexican ...	483	31.5.46	ps.1,464,000	+ ps.459,100	22	ps.7,706,200	ps.13,441,600	+ ps.5,220,200	Ord. Stk.	7½	4	4
Midland Uruguay	319	Nov., 1946	14,510	— 5,278	22	94,676	94,801	— 125	Ord. Sh.	75/6	67/6	73/9	
Nitrate ...	382	31.12.46	10,958	+ 505	52	212,575	191,819	+ 20,756	"	4	3	3	
N.W. of Uruguay	113	Nov., 1946	5,098	— 662	22	27,692	29,151	— 1,459	Pr.Li.Stk.	79½	77	50	
Paraguay Cent.	274	3.1.47	\$67,856	+ \$11,368	27	\$1,701,846	\$1,646,109	+ \$55,737	Pref.	10½	7½	8½	
Peru Corp. ...	1,059	Dec., 1946	147,153	+ 1,946	26	920,202	849,478	+ 70,724	Ord. Stk.	60½	50½	135½	
Salvador ...	100	Aug., 1946	c108,000	+ c14,000	9	c190,000	c189,000	+ c1,000	Ord. Sh.	17½	10½	18½	
San Paulo ...	153½	—	—	—	—	—	—	—	—	—	—	—	
Taital ...	156	Dec., 1946	3,680	— 480	26	29,410	15,520	+ 13,890	Ord. Sh.	3	1	1½	
United of Havana	1,301	4.1.47	50,075	+ 5,876	27	1,328,748	1,252,370	+ 76,378	"	—	—	—	
Uruguay Northern	73	Nov., 1946	1,386	— 331	22	6,596	9,065	— 2,469	"	—	—	—	
Canada													
Canadian National	23,482	Nov., 1946	9,282,000	+ 705,500	48	91,193,750	99,564,250	- 8,370,500	Ord. Stk.	24	14½	17½	
Canadian Pacific	17,037	7.1.47	1,008,250	- 109,000	1	1,008,250	1,117,250	- 109,000	"	—	—	—	
Various													
	Barsi Light ...	202	Oct., 1946	17,887	— 2,415	30	162,315	151,567	+ 10,748	Ord. Stk.	131	123	112½
	Beira ...	204	Sept., 1946	90,848	+ 17,136	52	950,694	920,575	+ 30,119	"	—	—	—
	Egyptian Delta	607	2.1.47	24,314	+ 2,892	39	443,463	417,123	+ 26,340	Prf. Sh.	10	8½	6
	Manila ...	—	—	—	—	—	—	—	—	B. Deb.	71	55½	71½
	Mid. of W. Australia...	277	Nov., 1946	10,257	— 6,808	22	79,714	81,902	— 2,188	Inc. Deb.	97½	85	70
	Nigeria ...	1,900	Oct., 1946	328,866	+ 30,729	30	2,594,380	1,607,174	+ 987,206	"	—	—	—
	Rhodesia ...	2,445	Sept., 1946	541,147	+ 24,052	52	6,174,663	6,069,663	+ 105,000	"	—	—	—
	South African	13,323	30.11.46	1,251,934	+ 159,203	34	39,933,637	35,322,923	+ 4,610,714	"	—	—	—
Victoria ...	4,774	June, 1946	1,196,661	- 23,996	—	—	—	—	"	—	—	—	

† Receipts are calculated on £s. 16d. to the rupee